Nutrient Management Plan

D & R Farm

Prepared by Dennis J Godar

Date Prepared: 2/20/2012

For Years; 2012-2016

Operation Name: **D & R Farm**
Owner / Operator's Name: **David E. Rollins Jr.**
Farm Address: **2102 White Oak Valley Road**
Cleveland, TN 37312

Operation Telephone Number: **(423) 650-0039 cell**
(423) 476-3670 Home

Conservation Planner

As a Conservation Planner, I certify that I have reviewed both the *Comprehensive Nutrient Management Plan* and *Producer Nutrient Management Activities* documents for technical adequacy and that the elements of the documents are technically compatible, reasonable and can be implemented.

Signature: _____ Date: _____
Name:
Title: Certification Credentials:

Owner/Operator

As the owner/operator of this CNMP, I, as the decision maker, have been involved in the planning process and agree that the items/practices listed in each element of the CNMP are needed. I understand that I am responsible for keeping all the necessary records associated with the implementation of this CNMP. It is my intention to implement/accomplish this CNMP in a timely manner as described in the plan.

Signature: _____ Date: _____
Name:

Table of Contents

Section 1. Background and Site Information

Purpose of the Comprehensive Nutrient Management Plan (CNMP)

The Comprehensive Nutrient Management Plan (CNMP) is a conservation system for your animal feeding operation. It is designed to address, at a minimum, the soil erosion and water quality concerns on your operation. The following soil erosion and water quality concerns have been identified on your farm:

Manure and Nutrient Management is managing the source, rate, form, timing, placement and utilization of manure, other organic by-products, bio-solids, and other nutrients in the soil and residues. The goal is to effectively and efficiently use the nutrient resources to adequately supply soils and plants to produce food, forage, fiber, and cover while minimizing the transport of nutrients to ground and surface water and environmental degradation.

Nitrogen and Phosphorus vs. Water Quality

Nitrogen and Phosphorus are two nutrients that have the potential to impair the quality of our groundwater and surface water. Nitrogen leaching out the root zone may enter a tile and be transported to surface water or it may leach to the groundwater. The EPA Drinking Water Maximum Contaminant Level (MCL) for Nitrates is 10 mg/L. Phosphorus leachate, or runoff entering the surface water may contribute to excessive algae growth which may cause low oxygen levels in surface water. This in turn may impair aquatic life. This manure and nutrient management plan will help to protect the groundwater and surface water.

1.1. General Description of Operation

D & R Farm is a poultry operation with capacity for approximately 66,000 broilers. The farm is owned and operated by David E. Rollins Jr. & Renee Rollins. Approximately 130 acres of spreadable cropland are included in this NMP for the operation. From time to time litter also may be sold off-site.

The operation is located in the White Oak Valley just east of the White Oak Mountain range. Surface drainage from the fields and facilities at the home farm flows south in grass waterways to Blackburn Creek that flows east to Apison Fork that flows approximately 2 miles north to Bixby Creek that flows approximately 3 miles southeast to Candies Creek. Most of the soils along the streams in this area will have high water tables in the spring. Land use in the area is croplands, pastures, hayfields and woodlands. Many of the streams in the area have riparian buffers that reduce the impacts of soil erosion and nutrient runoff while also providing wildlife habitat.

There are approximately 7 non-farm residences located within ½ mile. The closest neighboring residence is approximately 850 feet south along White oak Road. General topography of the land in the area is 2 -25%.

The operation is located in the *Candies Creek Lower* sub-watershed, (12-digit HUC: 060200021303) and the *Candies Creek*, watershed, (10-digit HUC: 0602000213). These areas are part of the sub-basin known as the *Hiwassee* Watershed. (8-digit HUC: 06020002). (See watershed reports at the end of this section).

1.2. Sampling, Calibration and Other Statements

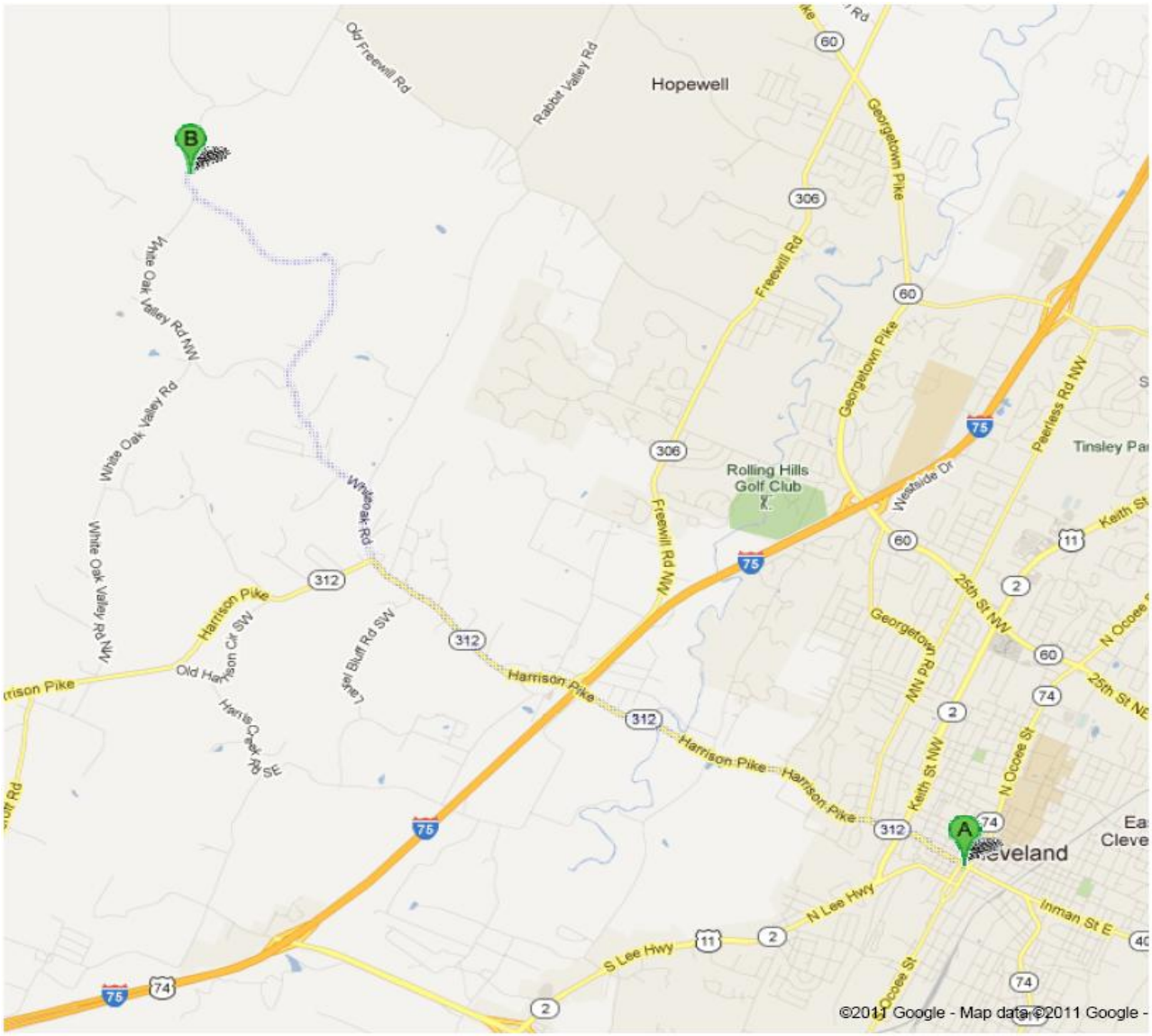
- Manure sampling frequency: All broiler litter and compost will be sampled and analyzed annually.

- Soil testing frequency: Soil testing should be done a minimum of every four years. or sooner. Soil testing is an important tool to manage soil fertility with proper use of manure and fertilizers to match plant nutrients to crop rotations.

- Equipment calibration should be accomplished annually and whenever changing rates. For surface applied solids, use of the 'tarp' method also is a check on uniformity of applications.

- Measures to prevent direct contact of animals with water: Broiler chickens are all housed inside of the broiler houses. None of the chickens are allowed outside of the confinement barns.

Location & Driving Directions:

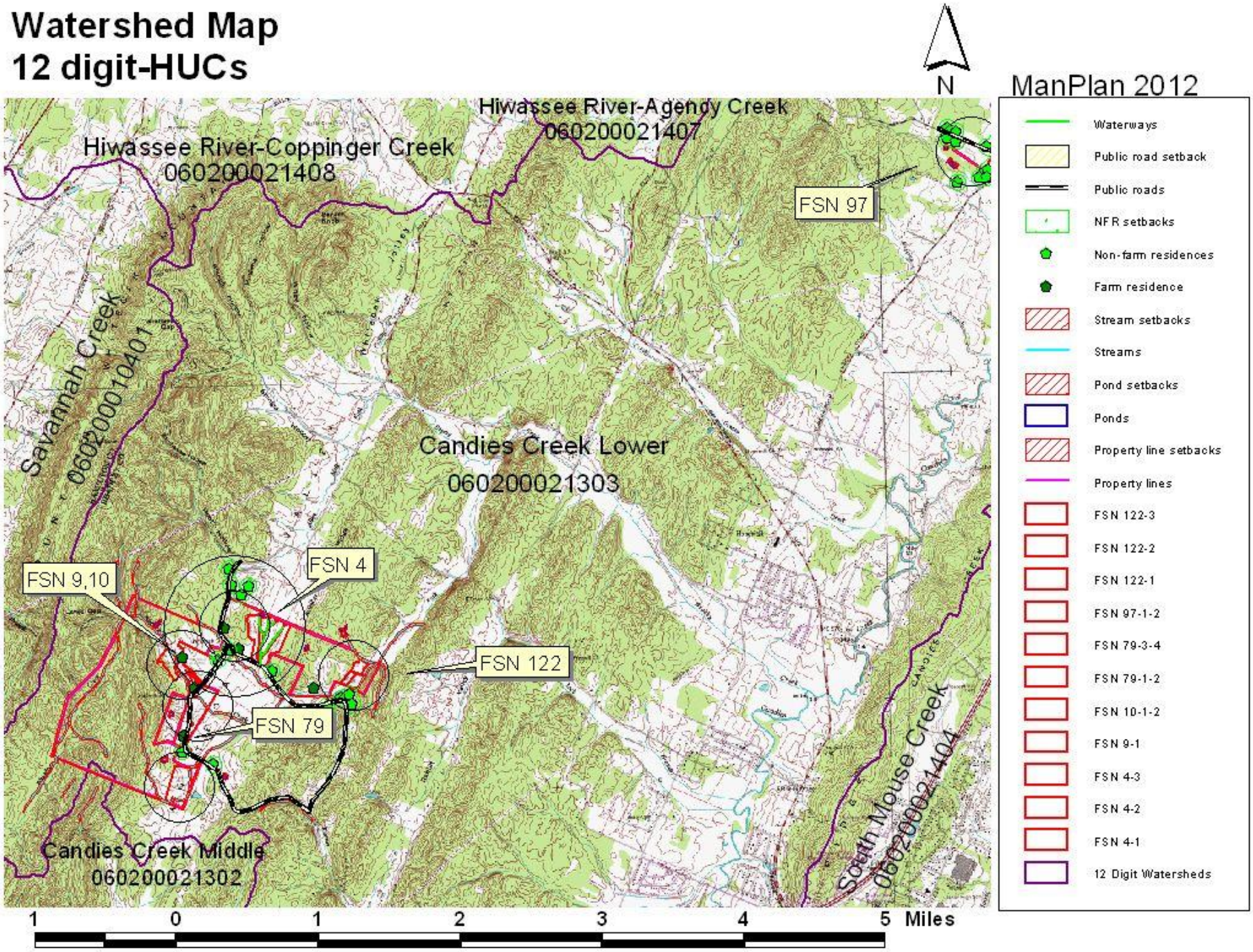


Cleveland, TN

	1. Head **northwest** on **Inman St W** toward **Broad St SW** About 2 mins	go 0.4 mi total 0.4 mi
312	2. Continue onto **TN-312 W/1st St NW/Harrison Pike** Continue to follow TN-312 W/Harrison Pike About 7 mins	go 3.7 mi total 4.2 mi
	3. Continue onto **Whiteoak Rd** About 4 mins	go 1.4 mi total 5.6 mi
	4. Turn right to stay on **Whiteoak Rd** About 5 mins	go 1.8 mi total 7.4 mi
	5. Turn right onto **White Oak Valley Rd NW** Destination will be on the right	go 0.2 mi total 7.6 mi

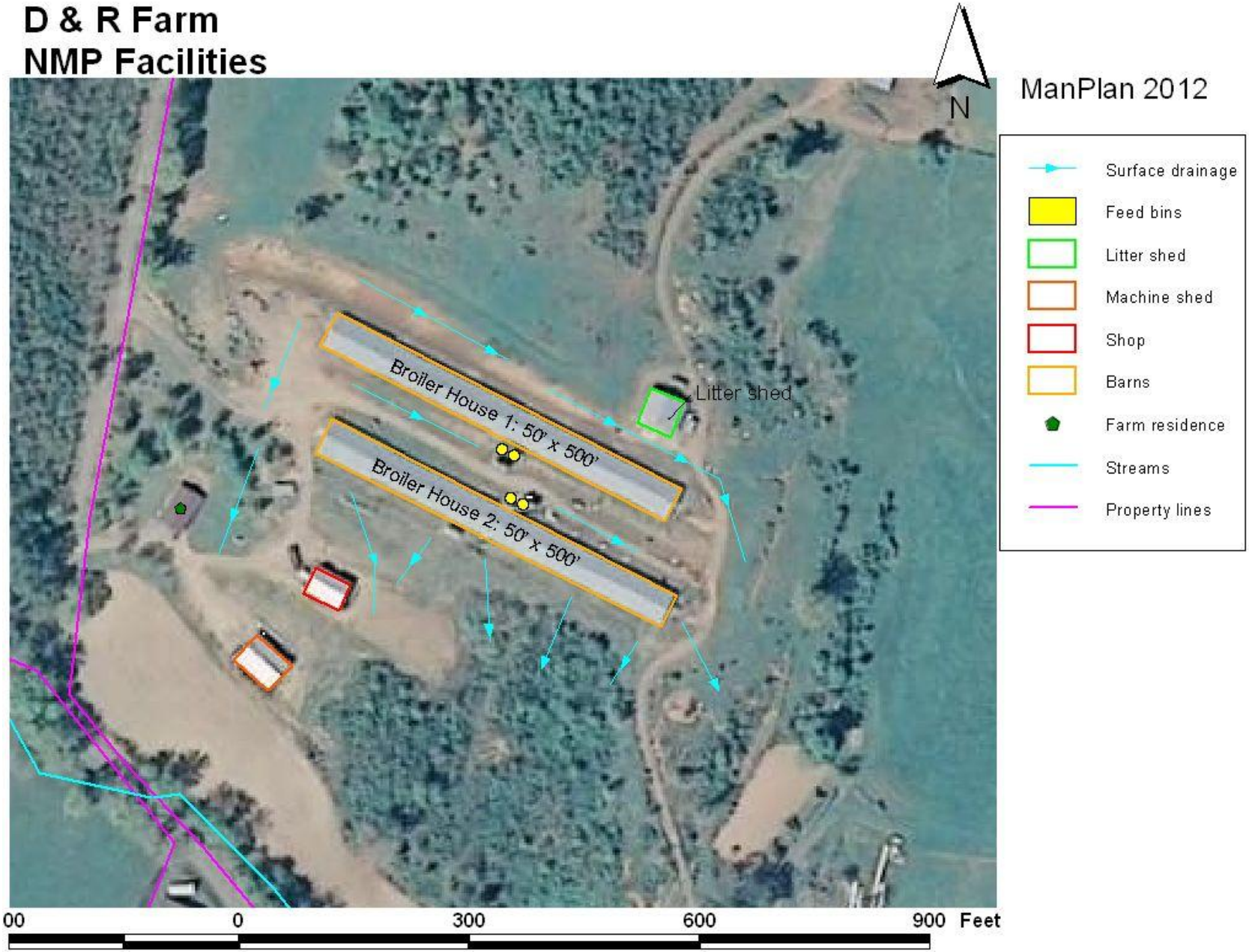
2102 White Oak Valley Rd, Cleveland, TN 37312

Watershed Map
12 digit-HUCs

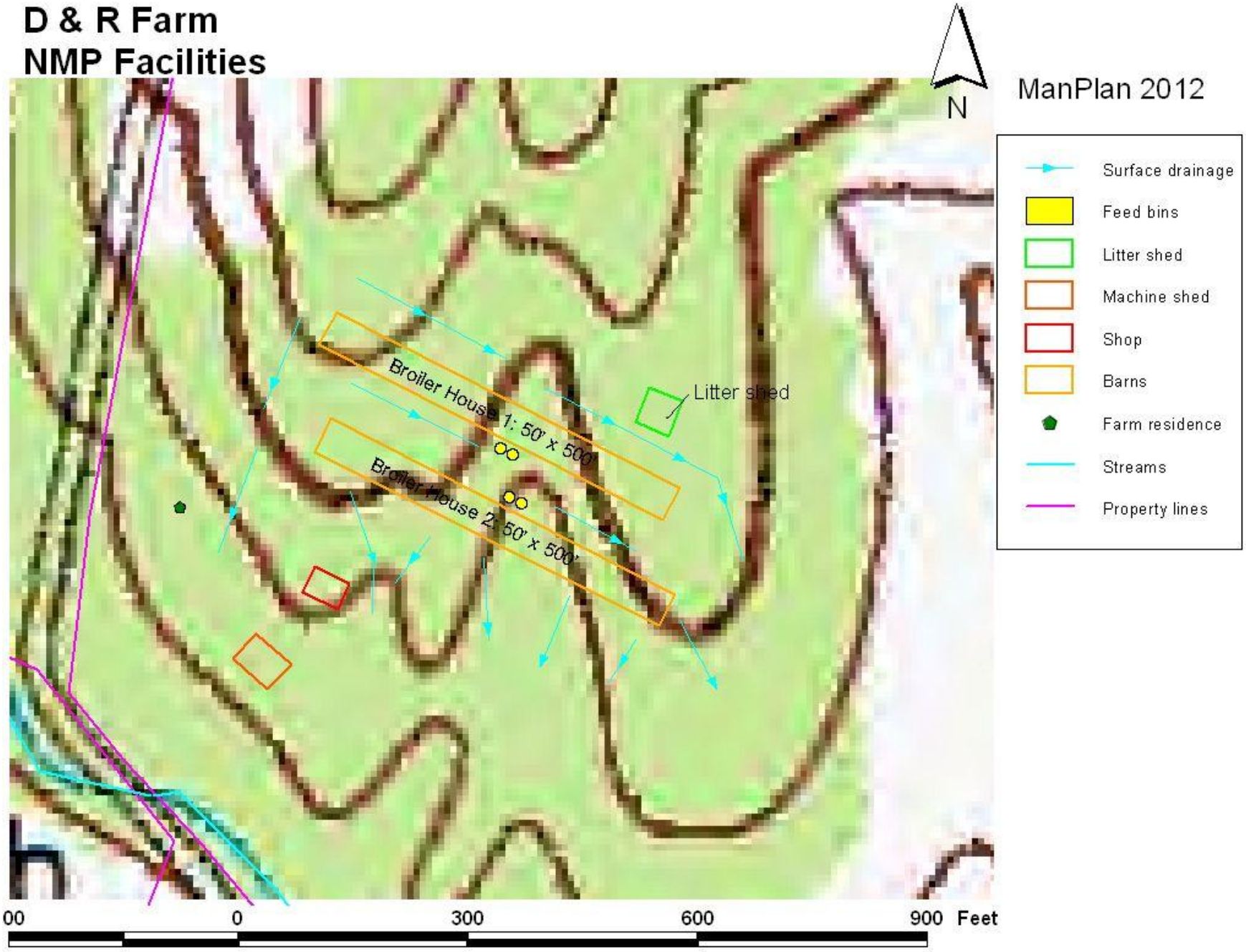


Section 2. Manure and Wastewater Handling and Storage

2.1. Map(s) of Production Area



2.2. Production Area Topographical Map



2.1 Animal and Manure Resources

The operation has 2 broiler barns with each barn with a capacity of 33,000 birds for a total capacity of 66,000 broilers. Barns 1 and 2 are 50' wide x 500' long and provide approximately 0.75 square feet of floor space per bird.

The operation raises broiler chickens under contract with an integrated poultry company. The operations will receive day old chicks which will be raised to market weights averaging up to 4.25 lbs. depending on the needs of the integrator company.

The broiler chicks are brought in from a hatchery at 1-days old after hatching. Chicks are placed under brooders and bedded with rice hulls litter. The barns are tunnel ventilated with large exhaust fans located on the end of the barns. Inlet air is drawn in through side walls, with automatically controlled curtains that raise and lower as needed.
Each flock of birds will be marketed in approximately 45-50 days and with 5-10 days for cleanout and re-conditioning of the litter, approximately 5 or 6 flocks per year can be raised in these facilities.

Litter is planned to be cleaned out once per year and reconditioned in between flocks the remainder of the year. Litter maintenance will consist of aerating and removing caked litter using a housekeeper machine between each flock. Remaining good litter can be re-spread in the barn and fresh sawdust or shavings added as needed. Partial cleanouts reduce overall litter requirements.

Part of the litter produced by the facilities will be applied to fields in this NMP and excess litter will be sold and transferred off site. Litter sales and transfer records will be kept for each year of the plan. Annual Record-keeping forms are in Section 9, arranged year by year. The operation is required to obtain a general operating permit from Tennessee Department of Environment and Conservation, (TDEC). Total litter produced, quantities and rates land applied and quantity sold off-site will be reported annually to TDEC.

The litter stack-house is 40' x 50' with 4' side walls. Litter can be stacked up to 5' or 6' depth if needed to store the litter until applied to fields or transferred off site.
Estimated annual litter and compost production of the 2 house site is estimated to be approximately 400 tons per year.

Storm water runoff from around the broiler houses, including barn roofs and driveways drains through grass filter areas and riparian waterways to the east and south of the facilities.

The Animal Waste Management (AWM) program was used to estimate volumes of manure and litter produced by the broiler operation. Tables 2-3 and 2-4 summarize the animal housing and manure storage capacities.

Litter was analyzed on July 25, 2011, by Agricultural Diagnostic Laboratory, University of Arkansas. Fayetteville, Arkansas. Nutrient analysis is summarized in Table 6.4 in Section 6. Annual litter analysis reports should be kept in the annual record-keeping section in this NMP.

2.3. Manure Storage

Storage ID	Type of Storage	Pumpable or Spreadable Capacity	Annual Manure Collected	Maximum Days of Storage
Barn 1	In-house litter storage	200 Tons	200 Tons	365
Barn 2	In-house litter storage	200 Tons	200 Tons	365
Stackhouse	Poultry manure dry stack	300 Tons	0 Tons	

2.4. Animal Inventory

Animal Group	Type or Production Phase	Number of Animals	Average Weight (Lbs)	Confinement Period	Manure Collected (%)	Storage Where Manure Will Be Stored
Barn 1	Broiler	33,000	2.1	Jan Early - Dec Late	100	Barn 1
Barn 2	Broiler	33,000	2.1	Jan Early - Dec Late	100	Barn 2
mortalities	Broiler	6,500	2.1	Jan Early - Dec Late	100	Freezer

(1) Number of Animals is the average number of animals that are present in the production facility at any one time
(2) If Manure Collected is less than 100%, this indicates that the animals spend a portion of the day outside of the production facility or that the production facility is unoccupied one or more times during the confinement period.

2.5. Normal Mortality Management

To decrease non-point source pollution of surface and ground water resources, reduce the impact of odors that result from improperly handled animal mortality, and decrease the likelihood of the spread of disease or other pathogens, approved handling and utilization methods shall be implemented in the handling of normal mortality losses.

Plan for Proper Management of Dead Animals

Mortalities are stored in a freezer until pick-up by a rendering service. Freezers and rendering services are provided by the poultry company that owns the broilers.

It is a priority of the operation to handle mortalities promptly, removing them from the facilities as soon as possible after discovery and placing them in the freezer.

Records of mortalities and transfers off-site will be kept as part of the NMP.

Additional discussion of contingency planning for proper animal disposal in case of catastrophic deaths and can be found in Section 3 under the Emergency Action Plan.

2.6. Planned Manure Exports off the Farm

Month-Year	Manure Source	Amount	Receiving Operation	Location
Apr 2012	Stackhouse	80 Tons	transfer off-site	
Apr 2013	Stackhouse	275 Tons	transfer off-site	
Apr 2014	Stackhouse	90 Tons	transfer off-site	
Apr 2015	Stackhouse	275 Tons	transfer off-site	
Apr 2016	Stackhouse	90 Tons	transfer off-site	

2.7. Planned Manure Imports onto the Farm

Month-Year	Manure's Animal Type	Amount	Originating Operation	Location

(None)

2.8. Planned Internal Transfers of Manure

Month-Year	Manure Source	Amount	Manure Destination
Feb 2012	Barn 1	25 Tons	Stackhouse
Feb 2012	Barn 2	25 Tons	Stackhouse
Apr 2012	Barn 1	75 Tons	Stackhouse
Apr 2012	Barn 2	75 Tons	Stackhouse
Jun 2012	Barn 1	25 Tons	Stackhouse
Jun 2012	Barn 2	25 Tons	Stackhouse
Aug 2012	Barn 1	25 Tons	Stackhouse
Aug 2012	Barn 2	25 Tons	Stackhouse
Oct 2012	Barn 1	25 Tons	Stackhouse
Oct 2012	Barn 2	25 Tons	Stackhouse
Dec 2012	Barn 1	25 Tons	Stackhouse
Dec 2012	Barn 2	25 Tons	Stackhouse
Feb 2013	Barn 1	25 Tons	Stackhouse
Feb 2013	Barn 2	25 Tons	Stackhouse
Apr 2013	Barn 1	75 Tons	Stackhouse
Apr 2013	Barn 2	75 Tons	Stackhouse
Jun 2013	Barn 1	25 Tons	Stackhouse
Jun 2013	Barn 2	25 Tons	Stackhouse
Aug 2013	Barn 1	25 Tons	Stackhouse
Aug 2013	Barn 2	25 Tons	Stackhouse
Oct 2013	Barn 1	25 Tons	Stackhouse
Oct 2013	Barn 2	25 Tons	Stackhouse
Dec 2013	Barn 1	25 Tons	Stackhouse
Dec 2013	Barn 2	25 Tons	Stackhouse
Feb 2014	Barn 1	25 Tons	Stackhouse

Month-Year	Manure Source	Amount	Manure Destination
Feb 2014	Barn 2	25 Tons	Stackhouse
Apr 2014	Barn 1	75 Tons	Stackhouse
Apr 2014	Barn 2	75 Tons	Stackhouse
Jun 2014	Barn 1	25 Tons	Stackhouse
Jun 2014	Barn 2	25 Tons	Stackhouse
Aug 2014	Barn 1	25 Tons	Stackhouse
Aug 2014	Barn 2	25 Tons	Stackhouse
Oct 2014	Barn 1	25 Tons	Stackhouse
Oct 2014	Barn 2	25 Tons	Stackhouse
Dec 2014	Barn 1	25 Tons	Stackhouse
Dec 2014	Barn 2	25 Tons	Stackhouse
Feb 2015	Barn 1	25 Tons	Stackhouse
Feb 2015	Barn 2	25 Tons	Stackhouse
Apr 2015	Barn 1	70 Tons	Stackhouse
Apr 2015	Barn 2	70 Tons	Stackhouse
Jun 2015	Barn 1	25 Tons	Stackhouse
Jun 2015	Barn 2	25 Tons	Stackhouse
Aug 2015	Barn 1	25 Tons	Stackhouse
Aug 2015	Barn 2	25 Tons	Stackhouse
Oct 2015	Barn 1	25 Tons	Stackhouse
Oct 2015	Barn 2	25 Tons	Stackhouse
Dec 2015	Barn 1	25 Tons	Stackhouse
Dec 2015	Barn 2	25 Tons	Stackhouse
Feb 2016	Barn 1	25 Tons	Stackhouse
Feb 2016	Barn 2	25 Tons	Stackhouse
Apr 2016	Barn 1	75 Tons	Stackhouse
Apr 2016	Barn 2	75 Tons	Stackhouse
Jun 2016	Barn 1	25 Tons	Stackhouse
Jun 2016	Barn 2	25 Tons	Stackhouse
Aug 2016	Barn 1	25 Tons	Stackhouse
Aug 2016	Barn 2	25 Tons	Stackhouse
Oct 2016	Barn 1	25 Tons	Stackhouse
Oct 2016	Barn 2	25 Tons	Stackhouse
Dec 2016	Barn 1	25 Tons	Stackhouse
Dec 2016	Barn 2	25 Tons	Stackhouse

2.9 Facility Closure Plan

If the facilities are no longer used for animal production or litter storage, the following activities should be carried out prior to decommissioning:

- All manure, litter and bedding shall be cleaned out of the facilities and the litter stack shed and mortality composter as soon as possible. Litter and compost should be transferred off site or applied per the Nutrient Management Plan. Any dead birds in the houses at the time of closure will be disposed of according to the current Nutrient Management plan. The most current litter analysis will be provided to anyone removing litter from the farm.
- This closure/ rehabilitation plan for the waste system storage/treatment structure(s) will meet or exceed NRCS technical standards and guidelines.
- The schedule for closure will not exceed 360 days from the time broiler production at this location ceases.
- The facilities may be converted to other uses such as equipment storage barns after performing the clean-out activities listed above.

MMP Input Data from AWM for: D & R Farm

Assisted by: ***ManPlan Inc***

Average Annual Manure Production Stored (for MMP "Analysis" tab)

Facility	Manure		Bedding		Wash Water	Flush Water	Runoff and Extr Precip	Rainfall	Annual Throughput Volume w/o 25Yr Rainfall and Runoff	
	Tons	Gallons	Tons	Gallons	Gallons	Gallons	Gallons	Gallons	Tons	Gallons
Dry Stack (Covered) #1	86	NA	27.4	NA	NA	NA	NA	NA	**113.4**	**NA**
Dry Stack (Covered) #2	86	NA	27.4	NA	NA	NA	NA	NA	**113.4**	**NA**
Dry Stack (Covered) #3	171	NA	0	NA	NA	NA	NA	NA	**171**	**NA**
Annual Total	343	0	55	0	0	0	0	0	**398**	**0**

Spreadable or Pumpable Capacity (for MMP "Storage" tab)

Facility	Manure		Bedding		Wash Water	Flush Water	Runoff & Extrn Precip	Rainfall	Design Storage Period	Design Volume w/o 25Yr Rainfall and Runoff	
	Tons	Gallons	Tons	Gallons	Gallons	Gallons	Gallons	Gallons	Months	Tons	Gallons
Dry Stack (Covered) #1	43.1	NA	13.8	NA	NA	NA	NA	NA	6	**56.9**	**NA**
Dry Stack (Covered) #2	43.1	NA	13.8	NA	NA	NA	NA	NA	6	**56.9**	**NA**
Dry Stack (Covered) #3	171.2	NA	0	NA	NA	NA	NA	NA	12	**171.2**	**NA**

Animal Production Data

Animal	Type of Animal	Number	Weight in Lb	Manure Produced per Animal Unit in CF/Day	Total Manure Produced in CF/Day	Annual Manure Produced in CF	Annual Manure Produced in Gal
Broilers	Poultry	66000	2.1	0.23	31.19	11,416	85,388
Totals		66000	N/A	N/A	31.19	11,416	85,388

Annual Production vs Storage

Manure Stored			Manure Not Captured		
(CF)	(Gal)	(Lbs)	(CF)	(Gal)	(Lbs)
11416	85392	684960	0	0	0

Animal Waste Management Plan Report

prepared for D & R Farm

Designed By: ManPlan Inc

Date: 2/22/2012

Checked By:

Date:

Farm Information

# of Operating Periods: 1 **State:** TN **Data Source:** NRCS-2008

Operating Period: January - December

Climate Data

County: Bradley

Station: CLEVELAND 6 NNE TN1808

25 Yr - 24 Hr Storm Event: 5.82 inches

Lagoon Loadings:

Rational Design Method:

Barth KVAL: 0

Load Rate for Odor, OCV: 0 lbs VS/cu. ft/day

LRV Max: 0.00625 lbs VS/cu. ft/day

NRCS Design Method:

Anaerobic Load Rate: 0 lbs VS/1000 cu. ft/day

Month	Prec. (in)	Evap. (in)
January	5.37	1.10
February	4.60	1.50
March	6.19	2.70
April	4.42	4.20
May	4.94	4.60
June	4.51	5.10
July	4.29	5.30
August	3.43	4.90
September	4.46	3.40
October	3.39	2.60
November	4.85	1.60
December	4.97	1.20
Total	55.42	38.20

Animal Data

Animal	Type	Quantity	Weight	Manure	VS	TS	Manure	Manure	VS	TS
			lbs	cu.ft/day/AU	lbs/day/AU	lbs/day/AU	cu.ft/day	lbs/day	lbs/day	lbs/day
Broilers	Poultry	66000	2.1	0.23	17.00	22.00	31.19	1871.4	2356.20	3049.20
Totals		66000	N/A	N/A	N/A	N/A	31.19	1871.4	2356.20	3049.20

Location Data

Percent of Manure Deposited in Each Location:

Period **1**

Barn 1	Animal Name	Percent Manure
	Broilers	25
Barn 2	**Animal Name**	**Percent Manure**
	Broilers	25
Stackshed	**Animal Name**	**Percent Manure**
	Broilers	50
Totals	**Animal Name**	**Percent Manure**
	Broilers	100

Additions Data

Waste Water VS Loading: 12.9

Operating Period: 1

Location	Wash Water	Flush Water	Bedding	Amount
	gal/day	gal/day		lbs/day
Stackshed	0.00	0.00		0.00
Barn 2	0.00	0.00	Sawdust - Shavings	150.00
Barn 1	0.00	0.00	Sawdust - Shavings	150.00

Runoff Data

Runoff Volume Method: Calculate Monthly Runoff Volumes with AWM

Pervious Watershed Area: 0 acres

Pervious Curve Number Storm 90

Pervious Curve Number Monthly 90 (1 day), 77 (30 day)

Impervious Area: 0 sq. ft

25 Year Pervious: 0.00 cu. ft

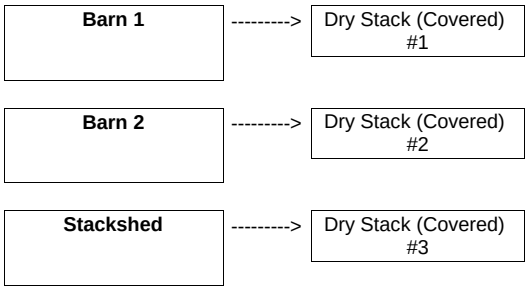
25 Year Impervious: 0.00 cu. ft

25 Year Total: 0.00 cu. ft

Runoff Volumes (1000 cu. ft.)

Month	Pervious	Impervious	Month Total
January	0.00	0.00	0.00
February	0.00	0.00	0.00
March	0.00	0.00	0.00
April	0.00	0.00	0.00
May	0.00	0.00	0.00
June	0.00	0.00	0.00
July	0.00	0.00	0.00
August	0.00	0.00	0.00
September	0.00	0.00	0.00
October	0.00	0.00	0.00
November	0.00	0.00	0.00
December	0.00	0.00	0.00
Total	0.00	0.00	0.00

Management Train



Facility Volume Data

Operating Period 1

Facility	Manure	Wash Water	Flush Water	Bedding	Total Vol
Dry Stack (Covered) #3	15.59	0.00	0.00	0.00	15.59
Dry Stack (Covered) #2	7.80	0.00	0.00	9.52	17.32
Dry Stack (Covered) #1	7.80	0.00	0.00	9.52	17.32

Waste Facilities

Dry Stack (Covered) #1

Max. Storage Vol. Method: Storage Volume

Storage Months: 6 months **Critical Months:** May - Apr

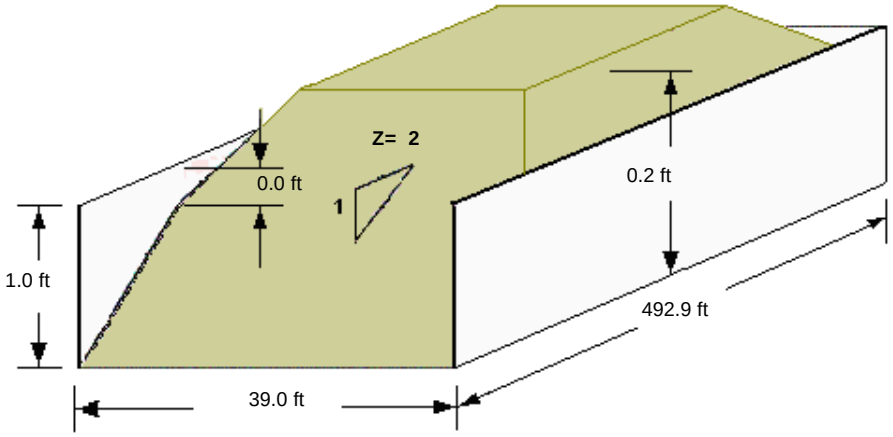
Design Dimensions

Shape: Rectangle
Sideslope: 2:1
Storage Depth: 0.2 ft
Freeboard: 0.0 ft
Wall Height: 1.0 ft

Top Length: 492.5 ft
Bottom Length: 492.9 ft
Top Width: 39.0 ft
Bottom Width: 39.0 ft
Bot Dimensions 39.0 x 492.9 ft
TopDimensions: 39.0 x 492.5 ft

Design Quantities

25Yr24Hr Storm Depth:
Prec Minus Evap Depth:
Volume Required (Wastes): 3187 cu. ft



Water Budget (1000 cu. ft.)

Month	Runoff	Withdrawal	Waste	Prec - Evap	Ext Prec	CumStorageVol
January	0	☐	0.54	6.83	0.00	0.54
February	0	☐	0.50	4.96	0.00	0.50
March	0	☐	0.54	5.58	0.00	0.54
April	0	☐	0.52	0.35	0.00	0.52
May	0	☐	0.54	0.54	0.00	0.54
June	0	☐	0.52	0.00	0.00	0.52
July	0	☐	0.54	0.00	0.00	0.54
August	0	☐	0.54	0.00	0.00	0.54
September	0	☐	0.52	1.69	0.00	0.52
October	0	☐	0.54	1.26	0.00	0.54
November	0	☐	0.52	5.20	0.00	0.52
December	0	☐	0.54	6.03	0.00	0.54

Dry Stack (Covered) #2

Max. Storage Vol. Method: Storage Volume

Storage Months: 6 months **Critical Months:** May - Apr

Design Dimensions

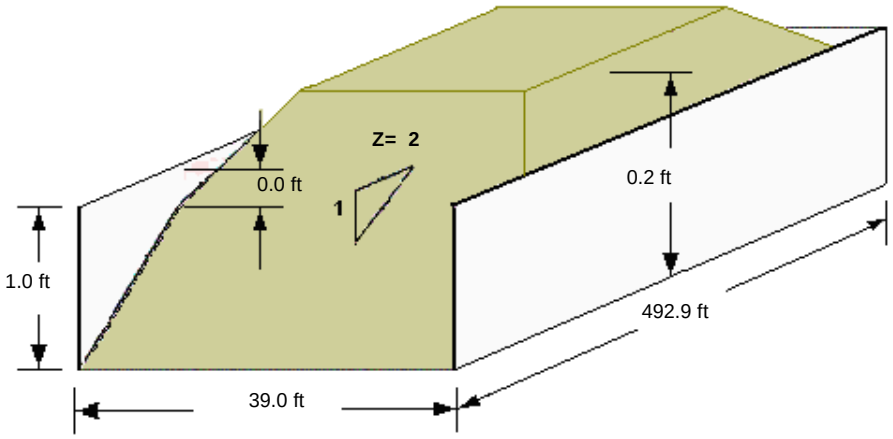
Shape:	Rectangle	**Top Length:**	492.5 ft
Sideslope:	2:1	**Bottom Length:**	492.9 ft
Storage Depth:	0.2 ft	**Top Width:**	39.0 ft
Freeboard:	0.0 ft	**Bottom Width:**	39.0 ft
Wall Height:	1.0 ft	**Bot Dimensions**	39.0 x 492.9 ft
		TopDimensions:	39.0 x 492.5 ft

Design Quantities

25Yr24Hr Storm Depth:

Prec Minus Evap Depth:

Volume Required (Wastes): 3187 cu. ft



Water Budget (1000 cu. ft.)

Month	Runoff	Withdrawal	Waste	Prec - Evap	Ext Prec	CumStorageVol
January	0	☐	0.54	6.83	0.00	0.54
February	0	☐	0.50	4.96	0.00	0.50
March	0	☐	0.54	5.58	0.00	0.54
April	0	☐	0.52	0.35	0.00	0.52
May	0	☐	0.54	0.54	0.00	0.54
June	0	☐	0.52	0.00	0.00	0.52
July	0	☐	0.54	0.00	0.00	0.54
August	0	☐	0.54	0.00	0.00	0.54
September	0	☐	0.52	1.69	0.00	0.52
October	0	☐	0.54	1.26	0.00	0.54
November	0	☐	0.52	5.20	0.00	0.52
December	0	☐	0.54	6.03	0.00	0.54

Dry Stack (Covered) #3

Max. Storage Vol. Method: Cum. Storage Vol

Storage Months: 12 months **Critical Months:** May - Apr

Design Dimensions

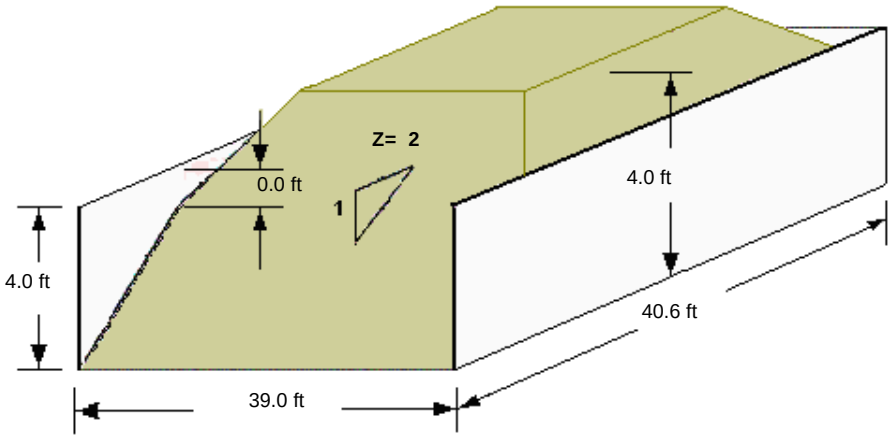
Shape:	Rectangle	**Top Length:**	32.6 ft
Sideslope:	2:1	**Bottom Length:**	40.6 ft
Storage Depth:	4.0 ft	**Top Width:**	39.0 ft
Freeboard:	0.0 ft	**Bottom Width:**	39.0 ft
Wall Height:	4.0 ft	**Bot Dimensions**	39.0 x 40.6 ft
		TopDimensions:	39.0 x 32.6 ft

Design Quantities

25Yr24Hr Storm Depth:

Prec Minus Evap Depth:

Volume Required (Wastes): 5707 cu. ft



Water Budget (1000 cu. ft.)

Month	Runoff	Withdrawal	Waste	Prec - Evap	Ext Prec	CumStorageVol
January	0	☐	0.48	0.44	0.00	4.30
February	0	☐	0.45	0.31	0.00	4.76
March	0	☐	0.48	0.33	0.00	5.24
April	0	☑	0.47	0.00	0.00	5.71
May	0	☐	0.48	0.00	0.00	0.48
June	0	☐	0.47	0.00	0.00	0.95
July	0	☐	0.48	0.00	0.00	1.43
August	0	☐	0.48	0.00	0.00	1.92
September	0	☐	0.47	0.07	0.00	2.39
October	0	☐	0.48	0.05	0.00	2.87
November	0	☐	0.47	0.32	0.00	3.34
December	0	☐	0.48	0.38	0.00	3.82

OPERATION AND MAINTENANCE GUIDELINES for Dry Stack (Covered) #1

Landowner:D & R Farm

Designed by: ManPlan Inc

This solids storage facility will store up to 3187 cubic feet of solid manure and bedding.

Typically, periodic scraping of manure is required to move the material into the storage facility. Bedding, or similar material, may need to be added to the manure in order for it to stack to the design height of .25 feet.

To allow time for land applying the material, consider the following. This structure is sized for 6 months storage. If the facility was emptied and land applied using a 455 cu. ft. spreader, it would take approximately 7 loads. Assuming 2 loads per hour, a total of 3.5 hours may be required.

Ground conditions must be evaluated prior to spreading. Irreversible compaction problems and damage to underground drainage systems may result from the excessive weight of a loaded spreader.

Caution should be exercised to insure that the material does not run or wash off from the land. Consult your Comprehensive Nutrient Management Plan (CNMP) for application rates and dates.

OPERATION AND MAINTENANCE GUIDELINES
for
Dry Stack (Covered) #2

Landowner:D & R Farm

Designed by: ManPlan Inc
This solids storage facility will store up to 3187 cubic feet of solid manure and bedding.

Typically, periodic scraping of manure is required to move the material into the storage facility. Bedding, or similar material, may need to be added to the manure in order for it to stack to the design height of .25 feet.

To allow time for land applying the material, consider the following. This structure is sized for 6 months storage. If the facility was emptied and land applied using a 455 cu. ft. spreader, it would take approximately 7 loads. Assuming 2 loads per hour, a total of 3.5 hours may be required.

Ground conditions must be evaluated prior to spreading. Irreversible compaction problems and damage to underground drainage systems may result from the excessive weight of a loaded spreader.

Caution should be exercised to insure that the material does not run or wash off from the land. Consult your Comprehensive Nutrient Management Plan (CNMP) for application rates and dates.

OPERATION AND MAINTENANCE GUIDELINES for Dry Stack (Covered) #3

Landowner:D & R Farm

Designed by: ManPlan Inc

This solids storage facility will store up to 5707 cubic feet of solid manure and bedding. Typically, periodic scraping of manure is required to move the material into the storage facility. Bedding, or similar material, may need to be added to the manure in order for it to stack to the design height of 4 feet.

To allow time for land applying the material, consider the following. This structure is sized for 12 months storage. If the facility was emptied and land applied using a 455 cu. ft. spreader, it would take approximately 12.5 loads. Assuming 2 loads per hour, a total of 6.3 hours may be required.

Ground conditions must be evaluated prior to spreading. Irreversible compaction problems and damage to underground drainage systems may result from the excessive weight of a loaded spreader.

Caution should be exercised to insure that the material does not run or wash off from the land. Consult your Comprehensive Nutrient Management Plan (CNMP) for application rates and dates.

Section 3. Farmstead Safety and Security

3.1. Emergency Response Plan

In Case of an Emergency Storage Facility Spill, Leak or Failure

Implement the following first containment steps:

a. Stop all other activities to address the spill.
b. Stop the flow. For example, use skid loader or tractor with blade to contain or divert spill or leak.
c. Call for help and excavator if needed.
d. Complete the clean-up and repair the necessary components.
e. Assess the extent of the emergency and request additional help if needed.

In Case of an Emergency Spill, Leak or Failure during Transport or Land Application

Implement the following first containment steps:

a. Stop all other activities to address the spill and stop the flow.
b. Call for help if needed.
c. If the spill posed a hazard to local traffic, call for local traffic control assistance and clear the road and roadside of spilled material.
d. Contain the spill or runoff from entering surface waters using straw bales, saw dust, soil or other appropriate materials.
e. If flow is coming from a tile, plug the tile with a tile plug immediately.
f. Assess the extent of the emergency and request additional help if needed.

Farm Information

Farm Name	**D & R Farm**
Address	**Farm Address: 2102 White Oak Valley Road, Cleveland, TN 37312** **Mailing address: 2102 White Oak Valley Road, Cleveland, TN 37312**
Farm Phone	**David E. Rollins Jr Cell: 423-650-0039 Home: 423-476-3670**
Permit #	***TNA 000039***
Directions to Farm	Cleveland, TN 1. Head **northwest** on **Inman St W** toward **Broad St SW** — About 2 mins — go 0.4 mi, total 0.4 mi 2. Continue onto **TN-312 W/1st St NW/Harrison Pike** — Continue to follow TN-312 W/Harrison Pike — About 7 mins — go 3.7 mi, total 4.2 mi 3. Continue onto **Whiteoak Rd** — About 4 mins — go 1.4 mi, total 5.6 mi 4. Turn right to stay on **Whiteoak Rd** — About 5 mins — go 1.8 mi, total 7.4 mi 5. Turn right onto **White Oak Valley Rd NW** — Destination will be on the right — go 0.2 mi, total 7.6 mi 2102 White Oak Valley Rd, Cleveland, TN 37312

Emergency Contacts

	Name	Emergency Phone	Cell Phone
Farm Owner	**David E. Rollins Jr**	**423-476-3670**	**423-650-0039**
Bradley County Sheriffs Office	**Jim Ruth**	**423-728-7311**	**911**
Fire Department	**Cleveland Fire Department Bradley Co. FD**	**911 423-559-3340 423-728-7293**	
Ambulance	**Bradley Co.**	**911 423-728-7010**	
Excavation Equipment: Backhoe, Dozer	**Wagner Backhoe Services Cleveland**	**423-559-9781**	

Agency Contacts

Contact Agency	Contact Person	Day Phone	Emergency Number
TWRA - Tenn. Wildlife Resources Agency			**(800) 890 TENN or (800) 890-8366**
TDEC-Environmental Assistance Center			**(888) 891-8332**
Bradley County Sheriffs Office	**Jim Ruth**	**423-728-7311**	**911**
State Veterinarian: (If mortality issues)	**Dr. Charles Hatcher, Nashville, TN**	**(615) 837-5120**	
UT Extension Cleveland, TN		**423-728-7001**	

Be prepared to provide the following information:

a. Your name and contact information.
b. Farm location (driving directions) and other pertinent information.
c. Description of emergency.
d. Estimate of the amounts, area covered, and distance traveled.
e. Whether manure has reached surface waters or major field drains.
f. Whether there is any obvious damage: employee injury, fish kill, or property damage.
g. Current status of containment efforts.

3.2. Biosecurity Measures

Biosecurity is critical to protecting livestock and poultry operations. Visitors must contact and check in with the producer before entering the operation or any production or storage facility. The farm has signs posted on entry doors restricting entry to authorized personnel only.

3.3. Catastrophic Mortality Management

Refer to NRCS standards, or state guidance, regarding appropriate catastrophic animal mortality handling methods.

Plan for Catastrophic Animal Mortality Handling

The following section describes how you plan to manage catastrophic loss of animals in a manner that protects surface and ground water quality. You must follow all national, state and local laws, regulations and guidelines that protect soil, water, air, plants, animals and human health.

***Rendering* is the first choice to manage large quantities of mortalities. The poultry integrator company should be called immediately and appropriate measure taken for trucking the mortalities to rendering facilities.**

If rendering is not available, composting or burial may be used as alternative methods.

***Composting*: Temporary composting may be allowed under direction of the State Veterinarian's office. The litter stack house should have adequate capacity for this purpose. If additional space is needed, the site will have an impermeable surface to prevent leaching into groundwater. Sufficient composting material must be used. Finished compost must be spread at agronomic rates.**

***Burial on site* is an alternative method for mortality management following these conditions:**

Burial sites will be located according to the following setbacks:
300 feet setback from any well head,
165 feet setback from property lines or public use area,
100 feet setback from waters of the state or wet weather conveyance, (waterways etc),
Burial sites will be in deep suitable soils more than 2 feet above bedrock and ground water table.
Ground water shall be greater than 2 feet below the bottom of the burial pit or trench.

A suitable burial location for this farm in trenches and observing all necessary setbacks is in the center of field 1 which is composed of Needmore Silt Loam (NeC).

(See Tennessee Emergency Disposal of Dead Animals in this section.)

Important! In the event of catastrophic animal mortality, contact the following authority before beginning carcass disposal:

Authority name: State Veterinarian of Tennessee
Contact name: Dr. Charles Hatcher
Phone number: (615) 837-5120

3.3. Fuels & Chemical Handling

Gasoline and diesel fuel is stored on site in above-ground storage tanks located northwest of the dairy barn. These tanks are inspected frequently. No leaks were observed. Detergents and disinfectants are stored in the tank room south of the dairy barn to be used for power washing and cleanup of the milking equipment. Roundup herbicide and other weed control chemicals are stored in the machine shed and used for maintaining fence lines and pastures as needed.
No other hazardous chemicals are stored at this location.

Fuel handling:

Small spills during fuel transfer are bound to occur from time to time. Petroleum fuel evaporates rapidly at the land surface; however fuel readily seeps into the soil. Local geology and soil type determines how quickly fuel may reach groundwater supplies. Once in the groundwater environment, fuel is relatively stable, making it difficult to clean up. Even small spills or leaks in the same place over time are a potential threat to water resources. To reduce potential leaks and spills during fuel transfer:

- Always supervise fuel transfer from storage to equipment to prevent spillover.
- Use a can to catch any drops that may follow after shutting off the fuel nozzle.
- Replace a leaking or defective nozzle promptly.
- Enforce a "no smoking" rule at the fuel handling and storage facility.
- Keep fuel pumps and nozzles secure from children or vandalism.
- Label each pump or nozzle as to the type of fuel dispensed.

Above-ground Storage Tanks (ASTs) provide easy access and greater opportunity to observe and monitor tanks that may be leaking as compared to underground tanks. However, placement of tanks above the ground requires that tanks be protected from impact by farm equipment and personal vehicles. Spending some time on the proper placement of a new tank or implementing safety procedures to an existing tank can greatly reduce any risks associated with an AST.

Following are specific points that should be addressed when conducting an assessment of your ASTs.

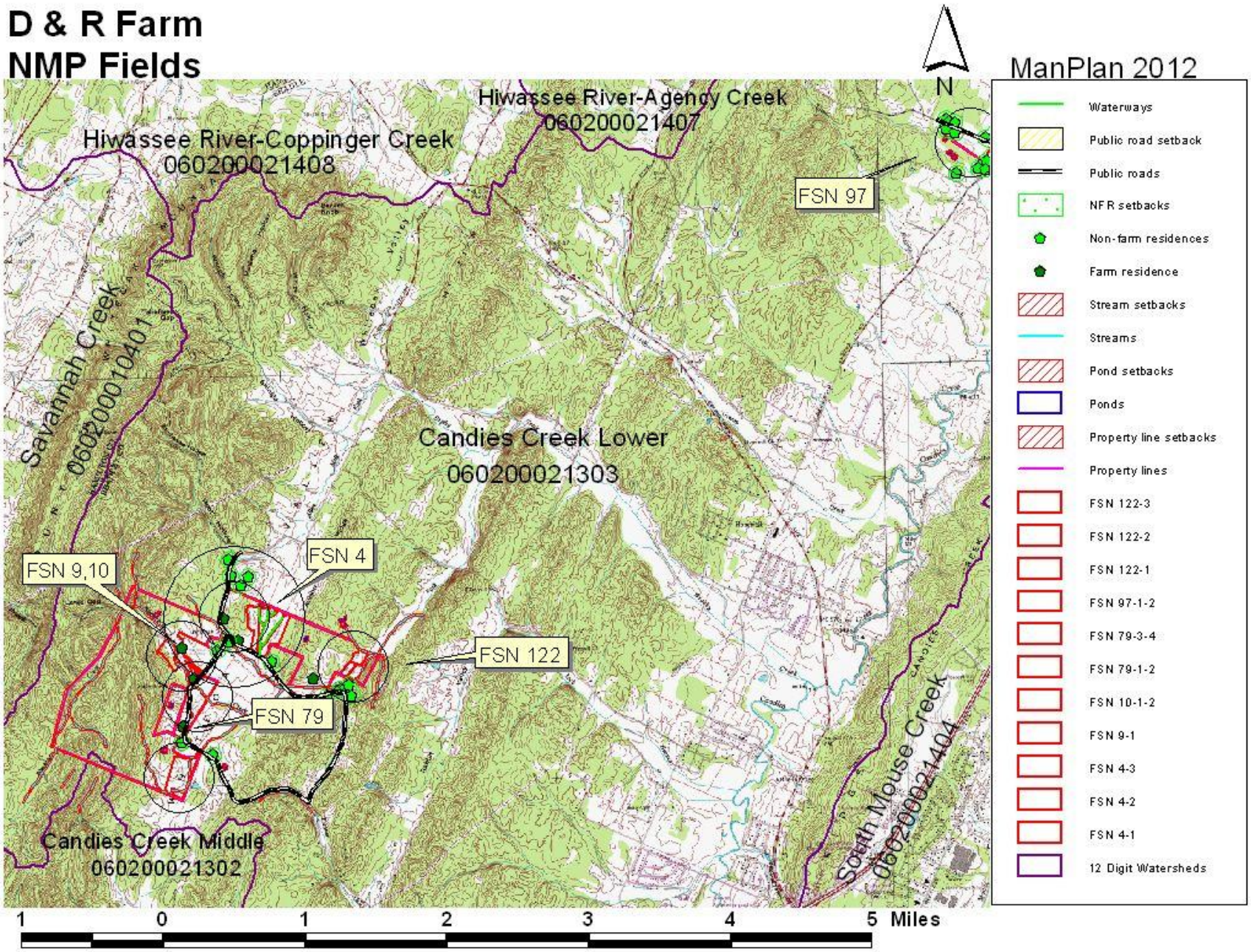
- Comply with state-local rules for electrical safety and fire prevention. Keep a fire extinguisher in close proximity (e.g. within 75 feet) of ASTs.
- AST's should be located at least 50 feet from any building or combustible storage.
- Properly label tank contents, describe the health and physical hazards of the product.
- Secure against vandalism and tampering.
- If top-opening only, place on a stable base of timbers, blocks, concrete, etc. ASTs should not be in contact with bare soil.
- Display a "No Smoking" sign.
- Guard tank against impact. Choose a site where farm vehicles can easily maneuver for fueling.
- Enclose wiring in a conduit.
- Locate ASTs where soil strength is adequate to hold the weight of a full storage tank (or tanks).

CHEMICALS: *For hazardous chemicals that may be stored on this site seasonally or year-round, the following guidelines should be implemented.*

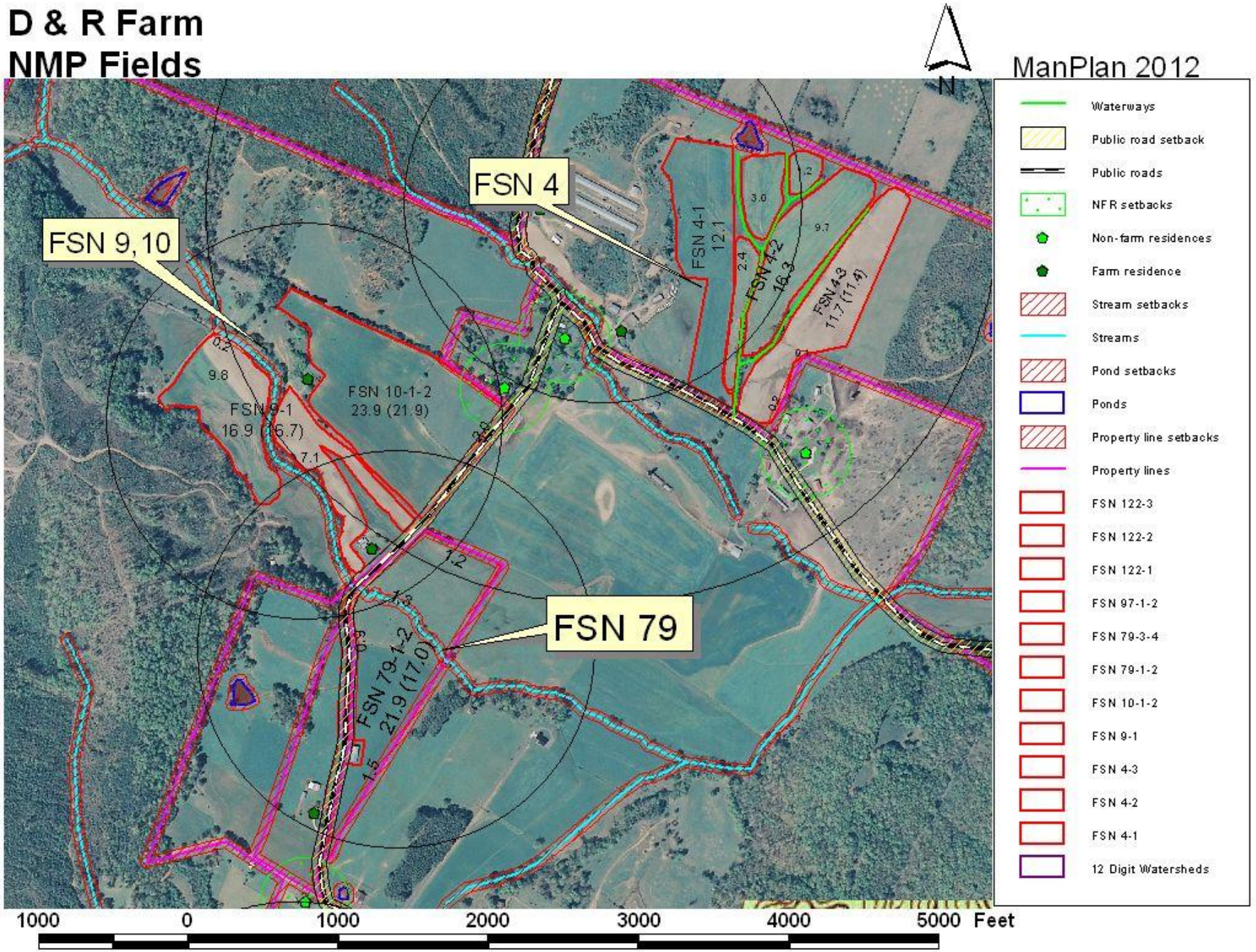
	Measure
X	All chemicals will be stored in proper containers. Expired chemicals and empty containers are properly disposed of in accordance with state and federal regulations. Pesticides and associated refuse are disposed of in accordance with the FIFRA label.
X	Chemical storage areas are self-contained with no drains or other pathways that will allow spilled chemicals to exit the storage area.
X	Chemical storage areas are covered to prevent chemical contact with rain or snow.
X	Emergency procedures and equipment are in place to contain and clean up chemical spills.
X	Chemical handling and equipment wash areas are designed and constructed to prevent contamination of surface waters and waste water and storm water storage and treatment systems.

Section 4. Land Treatment

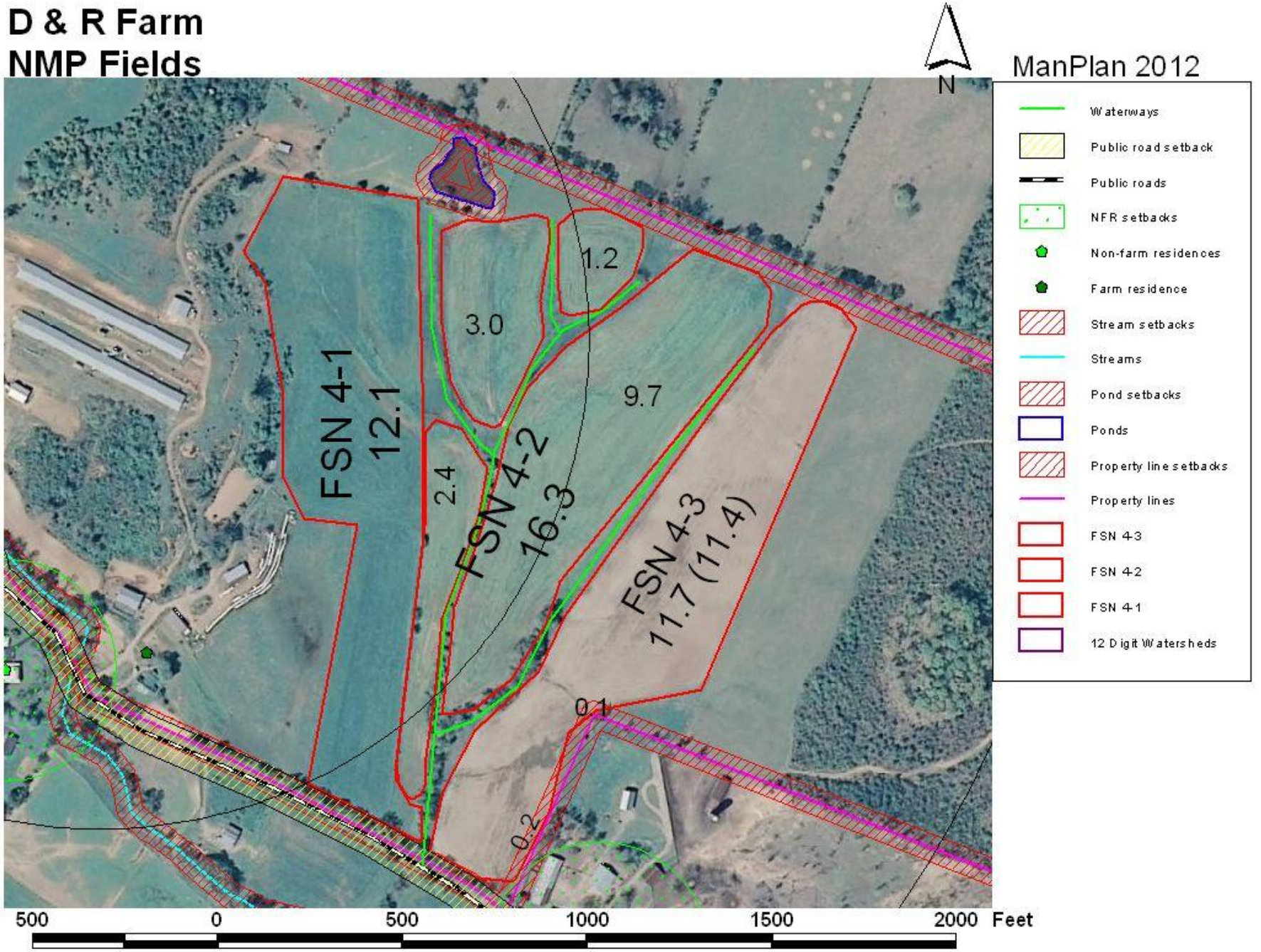
4.1. Map(s) of Fields and Conservation Practices



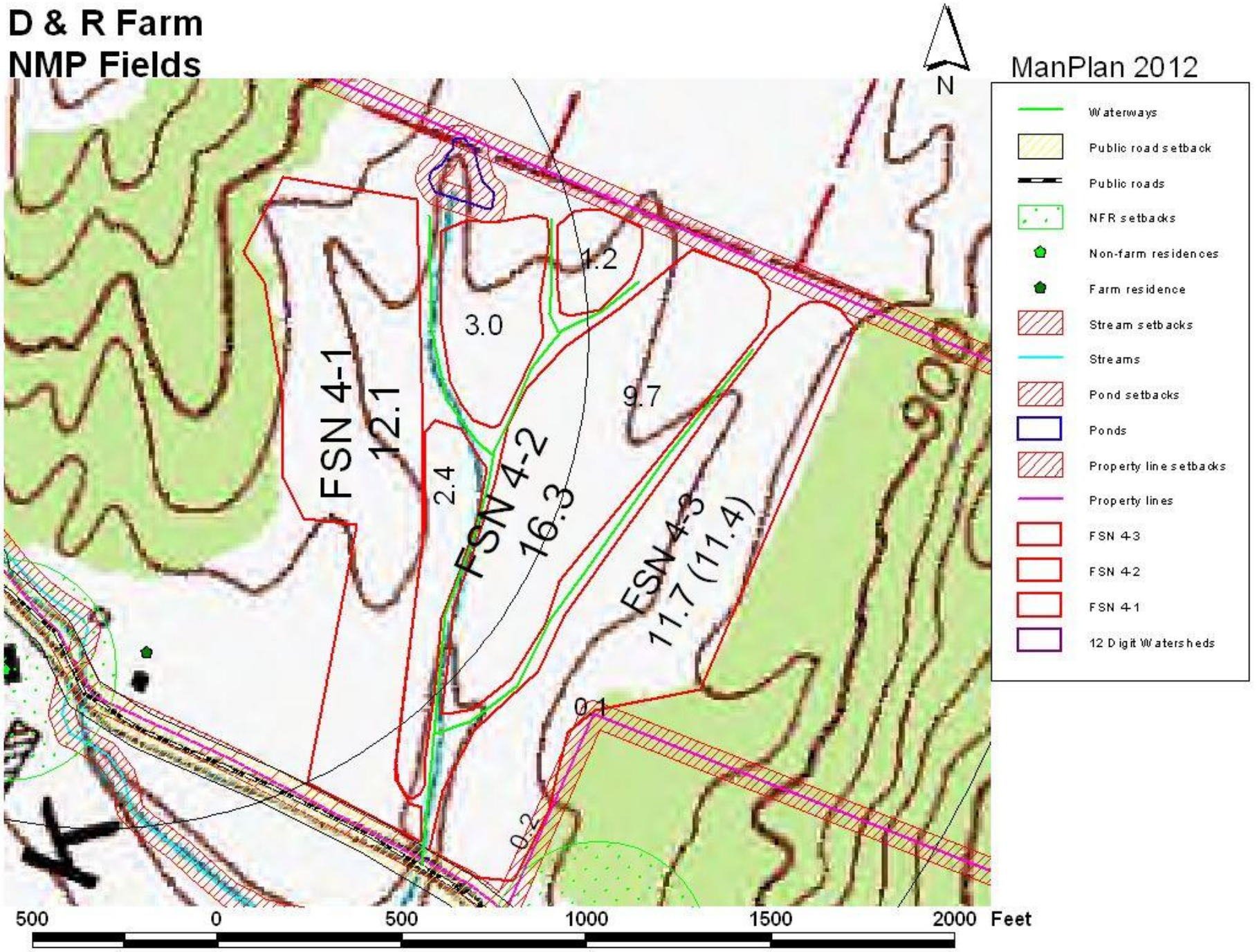
D & R Farm
NMP Fields



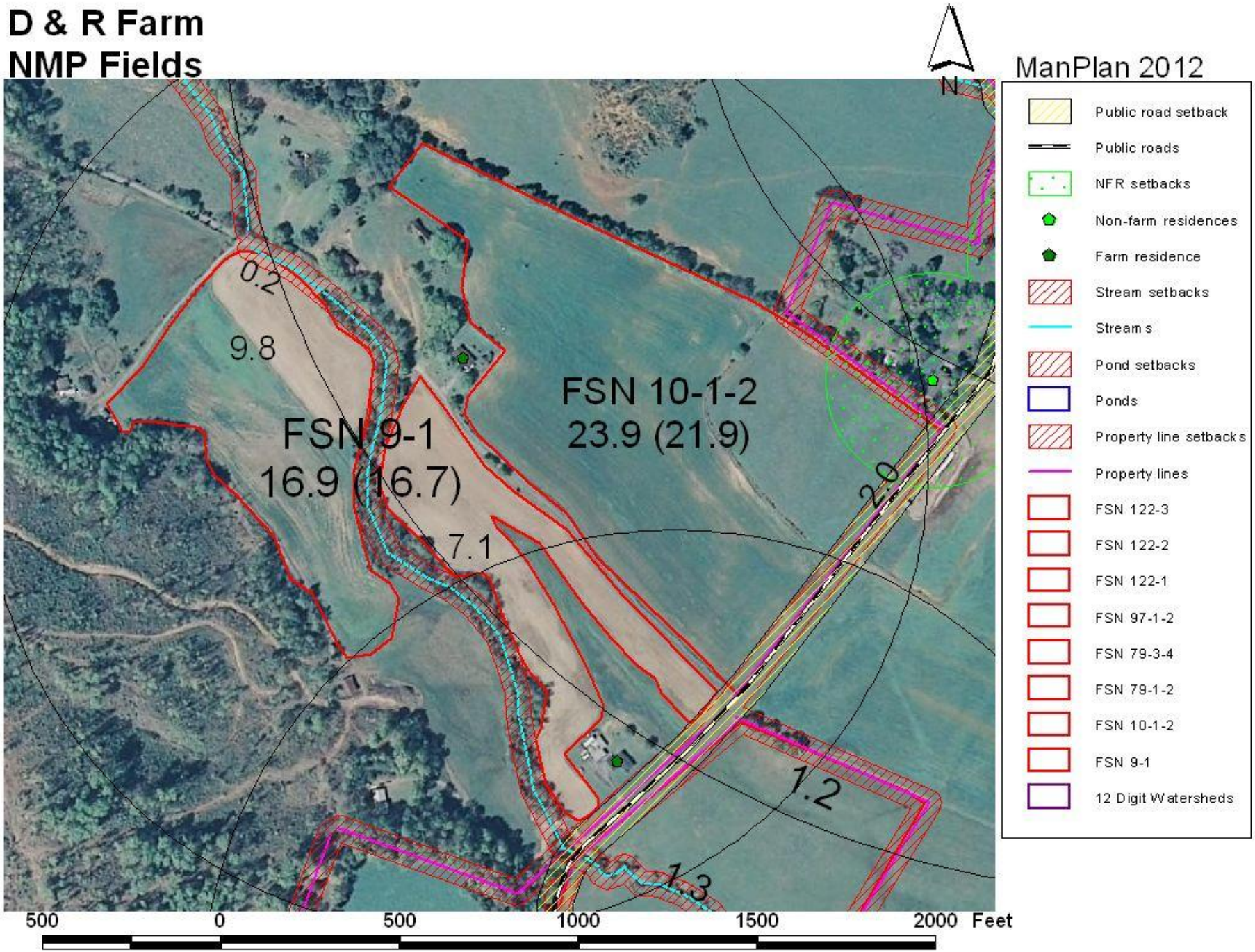
D & R Farm
NMP Fields



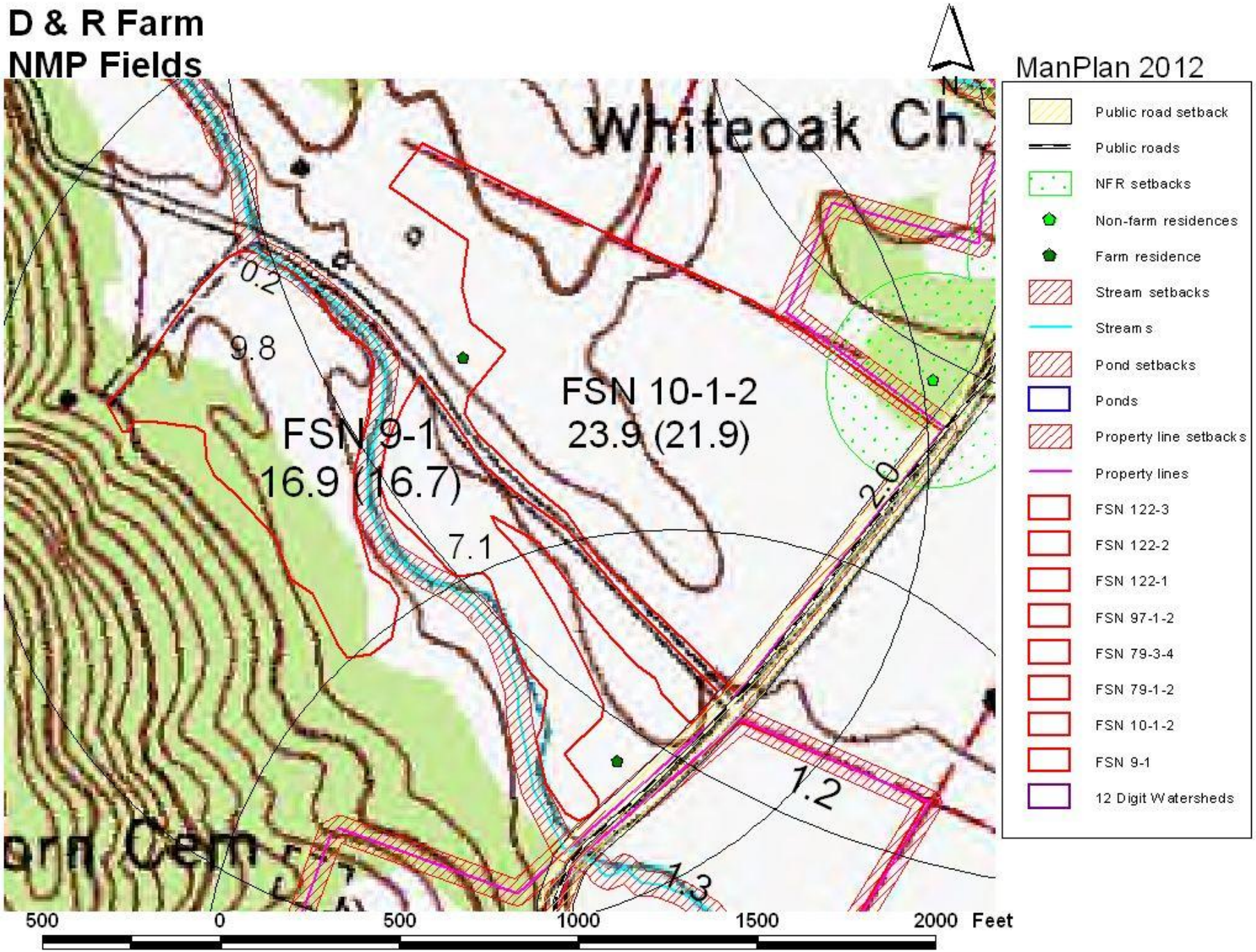
D & R Farm
NMP Fields



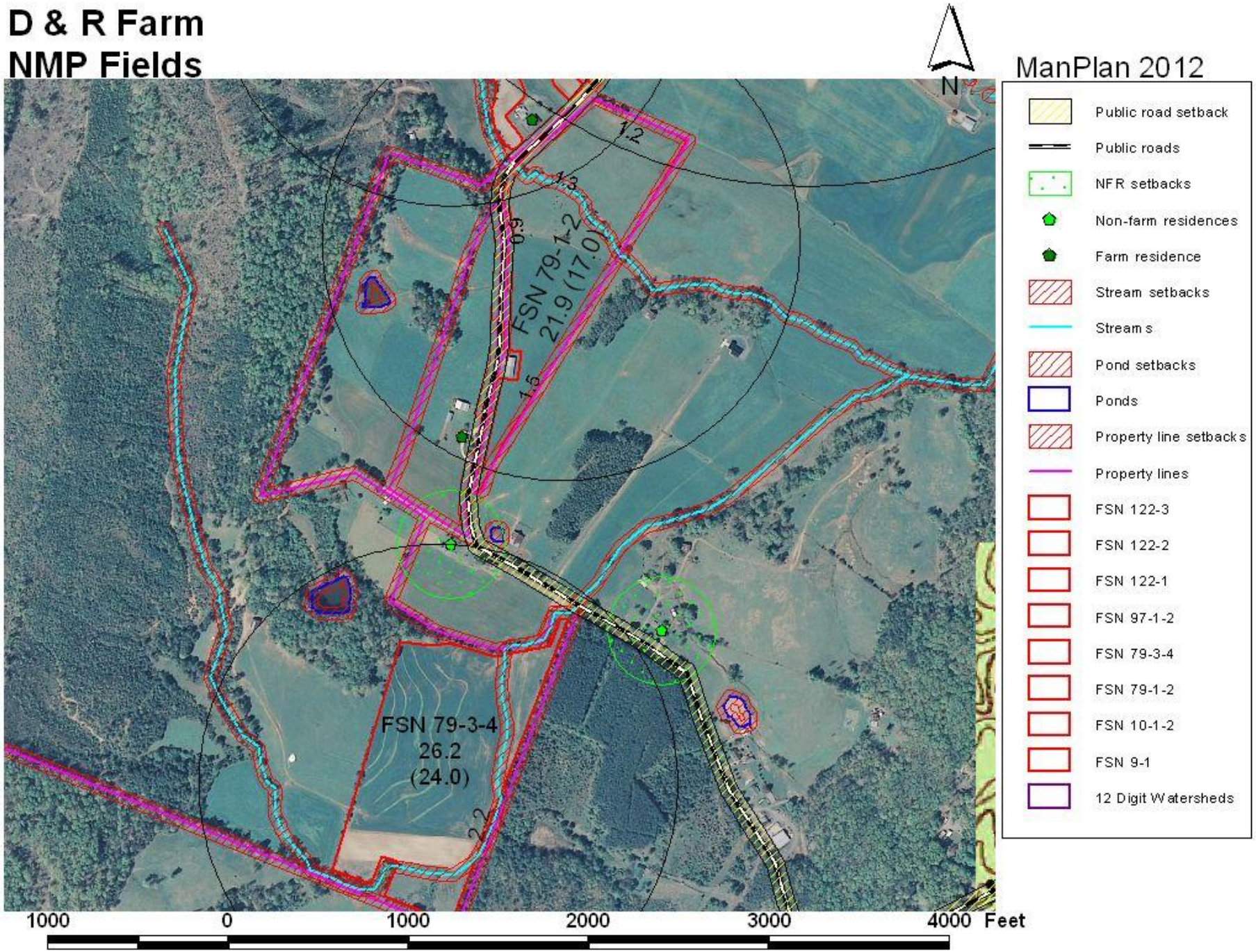
D & R Farm
NMP Fields



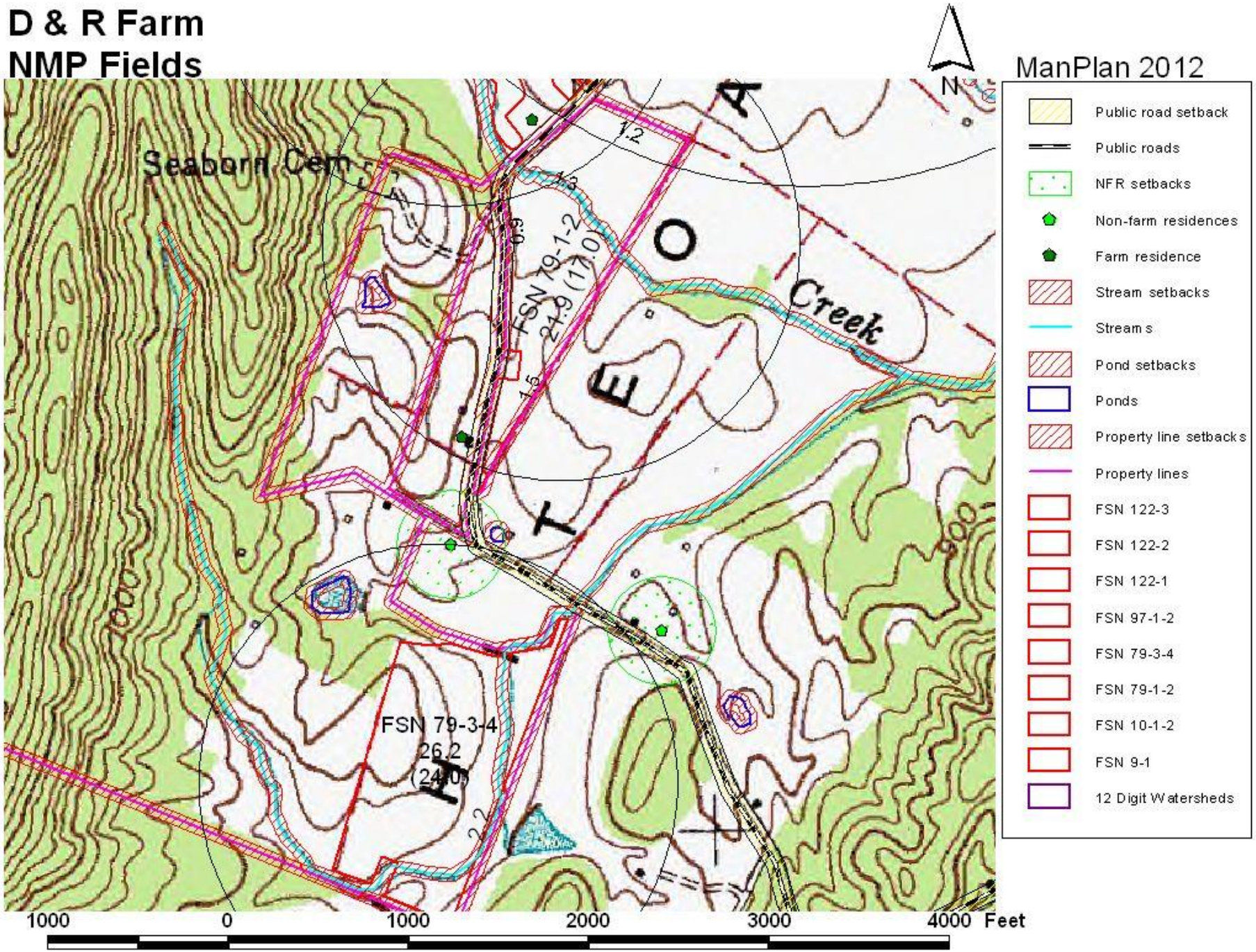
D & R Farm
NMP Fields



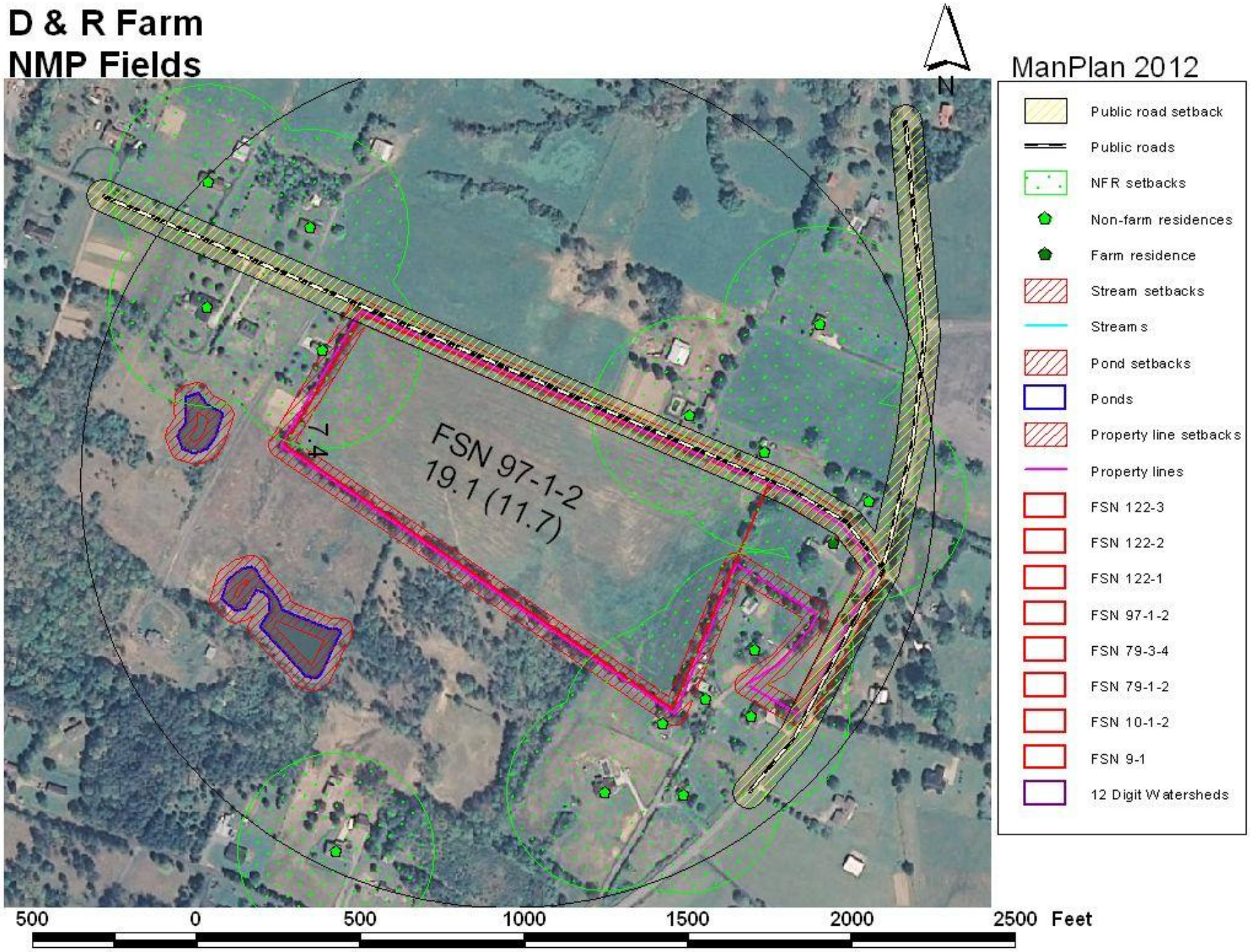
D & R Farm
NMP Fields



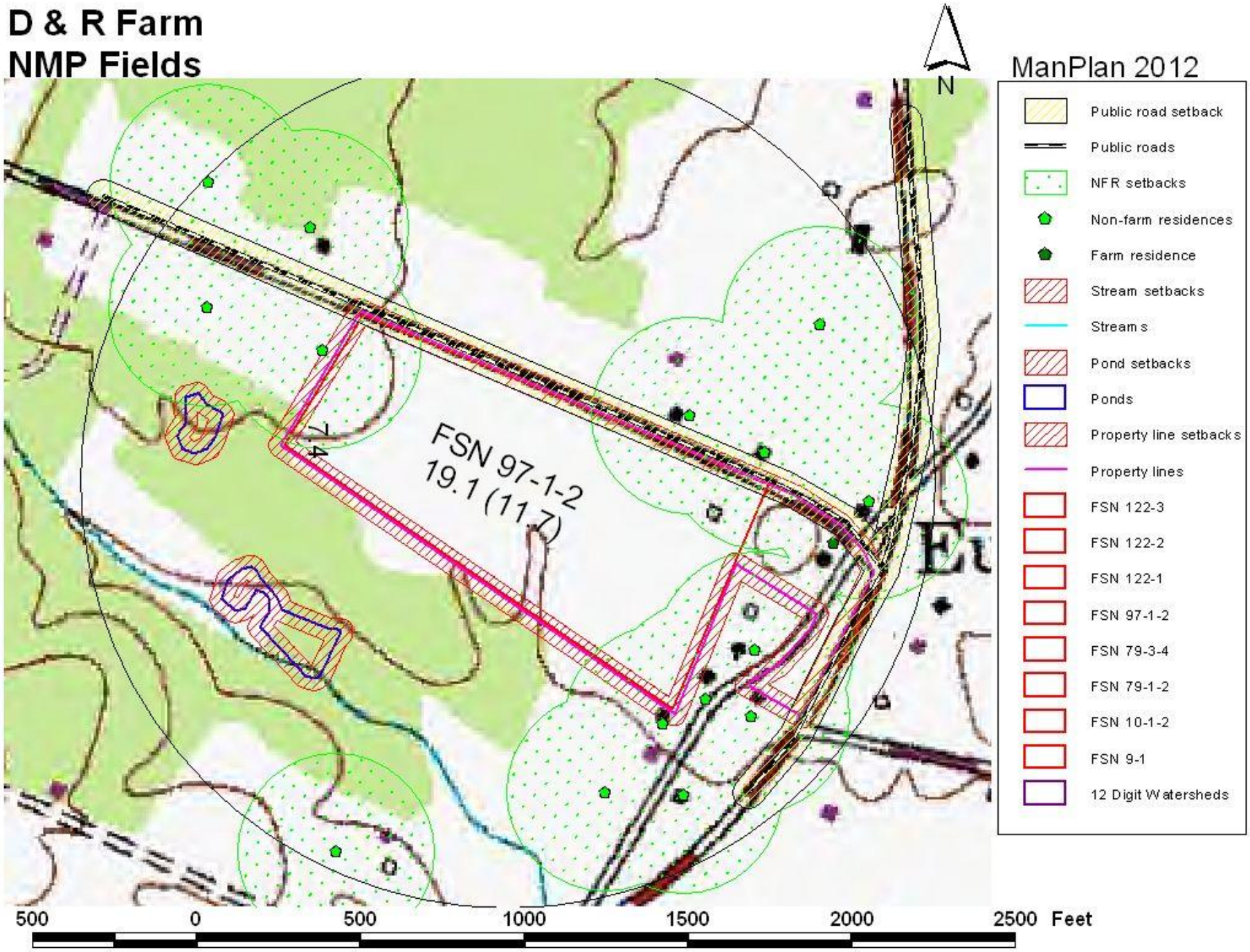
D & R Farm
NMP Fields



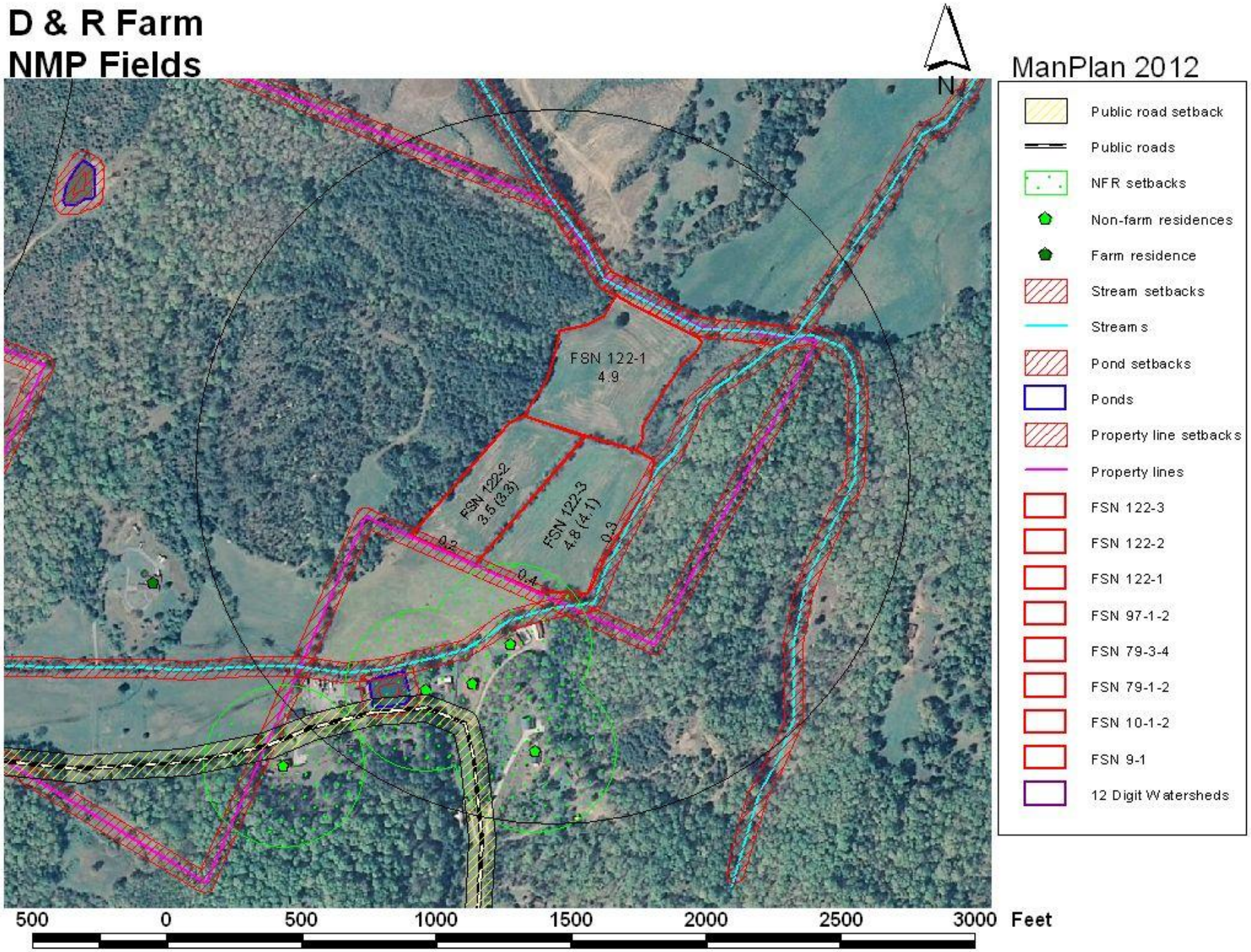
D & R Farm
NMP Fields



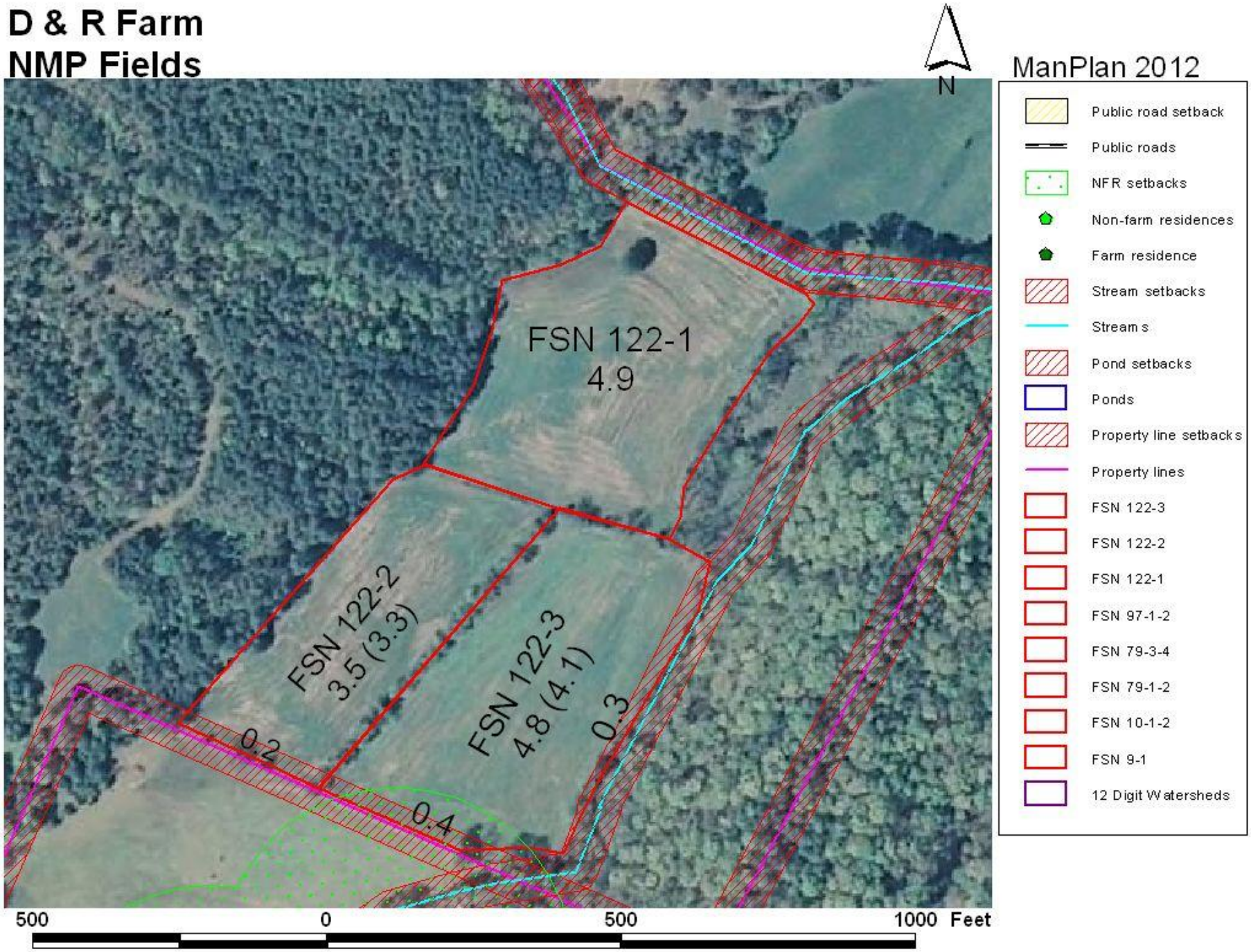
D & R Farm
NMP Fields



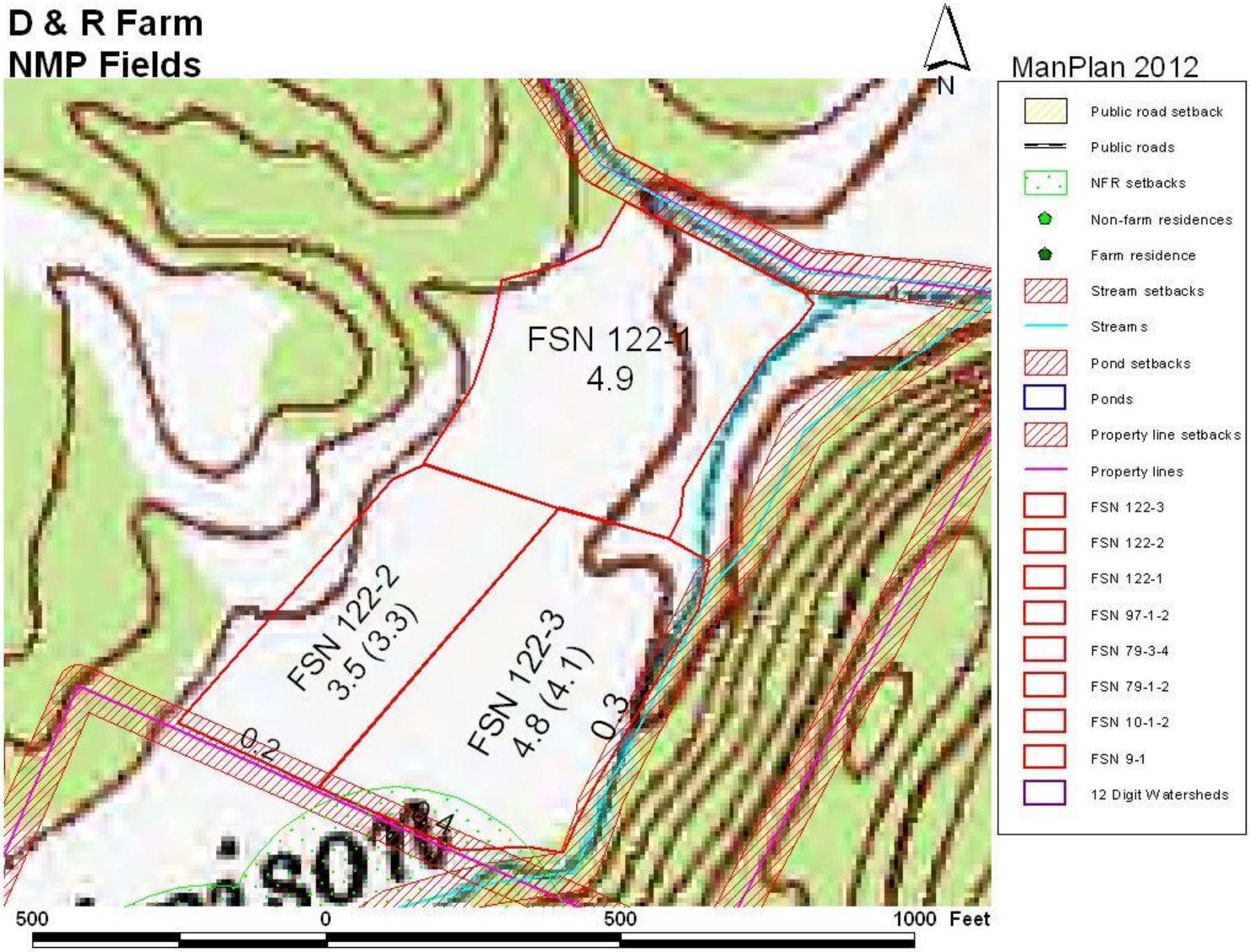
D & R Farm
NMP Fields



D & R Farm
NMP Fields



D & R Farm
NMP Fields



4.2. Land Treatment Conservation Practices

This section has individual field information for all fields in the nutrient management plan, including: Aerial photos and topographical maps, marked with setbacks and conservation practices implemented, soil tests results and RUSLE-2 individual field profiles.

Tabbed Information for each field:

- **FSA map**
- **Overview Map, (with conservation practices)**
- **Soil type maps**
- **RUSLE2 Individual Field Profile Report**
- **Soil Test results**

Necessary conservation practices have been established and maintained on cropland where animal by-products are applied. Refer to the conservation plan for any additional practices that may be implemented on this farm.

The following NRCS Standard Practices apply to this CNMP and are included in Section 10 for reference.

313 – Waste Storage Structure
590 -- Nutrient Management
633 -- Waste Utilization

Planned Land Treatment:

This section of the plan addresses management practices for all fields to reduce soil losses to or below tolerable soil losses or "T" values. Topography, soil types, slopes and lengths of slopes, crop yields, and crop management practices were taken into consideration as well as conservation practices and land treatment operations. RUSLE2 soil loss calculations were completed for all fields in this plan in the fall of 2011.

All fields are below "T" levels with the current system of land treatment forage crops, grazing management and seeding practices.

Soil types present in the fields included in this Nutrient Management Plan are:

Code	Soil Description	Acres	Percent of field	Non-Irr Class
Wd	Whitwell loam	14.7	11.0%	IIw
Ec	Etowah silt loam, eroded undulating phase	12.1	9.3%	IIe
Se	Sequoia silty clay loam, eroded rolling phase	10.8	8.3%	IVe
Sg	Staser loam	7	5.3%	IIw
Hb	Hermitage silt loam, eroded rolling phase (etowah)	6.9	5.3%	IIIe
Ha	Hamblen silt loam	6.2	4.8%	IIw
Sf	Sequoia silty clay loam, eroded undulating phase	5.9	4.5%	IIIe
Mo	Montevallo shaly silt loam, eroded rolling phase	5.7	4.4%	IVe
Hc	Hermitage silt loam, eroded undulating phase (etowah)	5.4	4.2%	IIe
Ch	Colbert silty clay, eroded undulating phase	5	3.9%	IVe
Ac	Apison silt loam, eroded undulating phase	4.6	3.6%	IIe
Tn	Tyler silt loam	4.3	3.3%	IIIw
Ba	Barbourville loam	4.1	3.2%	IIe
Mw	Muse silt loam, eroded undulating phase	4	3.1%	IIe
Mv	Muse silt loam, eroded rolling phase	3.9	3.0%	IIIe
Bb	Barbourville stony loam	3.5	2.7%	IIe
Eb	Etowah silt loam, eroded rolling phase	3	2.3%	IIIe
Lb	Leadvale silt loam, eroded undulating phase	3	2.3%	IIe
Ea	Emory silt loam	2.4	1.9%	I
Pf	Prader silt loam (melvin)	2.3	1.8%	IIIw
Ca	Capshaw silt loam, undulating phase	2.2	1.7%	IIe
Lf	Lehew-Montevallo loams, eroded steep phases	2.2	1.7%	VIIe
My	Muse silt loam, undulating phase	2	1.6%	IIe
Sk	Stony rolling and hilly land, limestone (rock outcrop)	1.7	1.3%	VIII
Cn	Cotaco loam	1.4	1.1%	IIe
Sd	Sequoia silty clay, severely eroded rolling phase	1.2	0.9%	VIe
Jb	Jefferson loam, eroded undulating phase	1.1	0.9%	IIe
Co	Cotaco silt loam	1.1	0.8%	IIe
Le	Lehew-Montevallo loams, eroded rolling phases	0.9	0.7%	IIIe
Mm	Montevallo and Muskingum soils, steep phases	0.6	0.4%	VIIe
Ld	Lehew-Montevallo loams, eroded hilly phases	0.4	0.3%	Ve
Mp	Montevallo shaly silt loam, eroded undulating phase	0.4	0.3%	IIIe
Lh	Lehew-Montevallo loams, rolling phases	0.1	0.1%	IIIe

Include Soil Map Unit Descriptions next page.

Section 5. Soil and Risk Assessment Analysis

5.1. Soil Information

Field	Soil Survey	Map Unit	Soil Component Name	Surface Texture	Slope Range (%)	OM Range (%)	Bedrock Depth (in.)	Hydrological Group
FSN 4-1	011	Mv	Muse	SIL	5-12%	1-3%	50	C
FSN 4-2	011	Mv	Muse	SIL	5-12%	1-3%	50	C
FSN 4-3	011	Jb	Jefferson	L	2-5%	0.5-3%		B
FSN 9-1	011	Wd	Whitwell	L	0-3%	1-3%		C
FSN 10-1-2	011	Ec	Etowah	SIL	2-5%	1-3%		B
FSN 79-1-2	011	Wd	Whitwell	L	0-3%	1-3%		C
FSN 79 3-4	011	Sg	Staser	L	0-3%	2-4%		B
FSN 97 1-2	011	Sf	Sequoia	SICL	2-5%	0.5-1%	31	C
FSN 122-1	011	Mw	Muse	SIL	2-5%	1-3%	50	C
FSN 122-2	011	Ld	Lehew	L	12-25%	1-4%	20	C
FSN 122-3	011	Tn	Tyler	SIL	0-3%	2-4%		D

5.2. Predicted Soil Erosion

Field	Predominant Soil Type	Slope (%)	Conserva-tion Plan Soil Loss (Ton/A/Yr)	Gully (Ton/A/Yr)	Ephemeral (Ton/A/Yr)	T Factor (Ton/A/Yr)
FSN 4-1	Mv (Muse SIL)	5.0	1.0			4
FSN 4-2	Mv (Muse SIL)	5.0	1.0			4
FSN 4-3	Jb (Jefferson L)	3.0	1.0			5
FSN 9-1	Wd (Whitwell L)	2.0	0.4			5
FSN 10-1-2	Ec (Etowah SIL)	3.0	1.6			5
FSN 79-1-2	Wd (Whitwell L)	1.0	0.4			5
FSN 79 3-4	Sg (Staser L)	1.0	0.6			5
FSN 97 1-2	Sf (Sequoia SICL)	3.0	1.3			3
FSN 122-1	Mw (Muse SIL)	3.0	1.6			4
FSN 122-2	Ld (Lehew L)	10.0	0.10			2
FSN 122-3	Tn (Tyler SIL)	2.0	0.10			3

Crop period water soil loss **Tons/acre**

Field	Crop Year	Primary Crop	Starting Date (mm/dd/yyyy)	Ending Date (mm/dd/yyyy)	Crop Period Soil Loss
FSN 4-1	2012	Corn grain	10/6/2011	10/1/2012	2.5
	2013	Soybean	10/2/2012	10/5/2013	1.6
	2014	Corn grain	10/6/2013	10/1/2014	3.1
	2015	Soybean	10/2/2014	10/5/2015	1.7
	2016	Corn grain	10/6/2015	10/17/2016	3.8
FSN 4-2	2012	Corn grain	10/6/2011	10/1/2012	2.5
	2013	Soybean	10/2/2012	10/5/2013	1.6
	2014	Corn grain	10/6/2013	10/1/2014	3.1
	2015	Soybean	10/2/2014	10/5/2015	1.7
	2016	Corn grain	10/6/2015	10/17/2016	3.8
FSN 4-3	2012	Soybean	10/1/2011	9/30/2012	1.2

Field	Crop Year	Primary Crop	Starting Date (mm/dd/yyyy)	Ending Date (mm/dd/yyyy)	Crop Period Soil Loss
	2013	Corn grain	10/1/2012	9/30/2013	1.9
	2014	Soybean	10/1/2013	9/30/2014	1.2
	2015	Corn grain	10/1/2014	9/30/2015	1.9
	2016	Soybean	10/1/2015	9/30/2016	1.2
FSN 9-1	2012	Corn grain	10/6/2011	10/1/2012	1.0
	2013	Soybean	10/2/2012	10/5/2013	0.8
	2014	Corn grain	10/6/2013	10/1/2014	1.2
	2015	Soybean	10/2/2014	10/5/2015	0.8
	2016	Corn grain	10/6/2015	10/17/2016	1.4
FSN 10-1-2	2012	Corn grain	10/6/2011	10/1/2012	2.3
	2013	Soybean	10/2/2012	10/5/2013	1.8
	2014	Corn grain	10/6/2013	10/1/2014	2.9
	2015	Soybean	10/2/2014	10/5/2015	1.9
	2016	Corn grain	10/6/2015	10/17/2016	3.4
FSN 79-1-2	2012	Soybean	10/1/2011	9/30/2012	0.5
	2013	Corn grain	10/1/2012	9/30/2013	0.8
	2014	Soybean	10/1/2013	9/30/2014	0.5
	2015	Corn grain	10/1/2014	9/30/2015	0.8
	2016	Soybean	10/1/2015	9/30/2016	0.5
FSN 79 3-4	2012	Corn grain	10/6/2011	10/1/2012	0.8
	2013	Soybean	10/2/2012	10/5/2013	0.7
	2014	Corn grain	10/6/2013	10/1/2014	1.0
	2015	Soybean	10/2/2014	10/5/2015	0.7
	2016	Corn grain	10/6/2015	10/17/2016	1.2
FSN 97 1-2	2012	Soybean	10/1/2011	9/30/2012	1.6
	2013	Corn grain	10/1/2012	9/30/2013	2.6
	2014	Soybean	10/1/2013	9/30/2014	1.6
	2015	Corn grain	10/1/2014	9/30/2015	2.6
	2016	Soybean	10/1/2015	9/30/2016	1.6
FSN 122-1	2012	Corn grain	10/6/2011	10/1/2012	2.3
	2013	Soybean	10/2/2012	10/5/2013	1.8
	2014	Corn grain	10/6/2013	10/1/2014	2.9
	2015	Soybean	10/2/2014	10/5/2015	1.9
	2016	Corn grain	10/6/2015	10/17/2016	3.4
FSN 122-2	2012	Corn grain	10/6/2011	10/1/2012	0.10
	2013	Soybean	10/2/2012	10/5/2013	0.10
	2014	Corn grain	10/6/2013	10/1/2014	0.10
	2015	Soybean	10/2/2014	10/5/2015	0.10
	2016	Corn grain	10/6/2015	10/17/2016	0.10
FSN 122-3	2012	Corn grain	10/6/2011	10/1/2012	0.10
	2013	Soybean	10/2/2012	10/5/2013	0.10
	2014	Corn grain	10/6/2013	10/1/2014	0.10
	2015	Soybean	10/2/2014	10/5/2015	0.10
	2016	Corn grain	10/6/2015	10/17/2016	0.10

5.3. Nitrogen and Phosphorus Risk Analysis

Tennessee Phosphorus Index

The Tennessee Phosphorus (P) index was used to determine the potential for phosphorus transport off the fields. Considering all of the parameters that go into calculating the Phosphorus Index, Table 9 (next page), summarizes the P-Index for each field. Planned manure applications will not have a significant impact on the P-Index in the fields in this NMP unless exceeding the maximum rates listed on Table 9. All fields have P-Indexes rated MEDIUM at the indicated application rates for P2O5.

While soil test P is not the only factor affecting Phosphorus environmental risks, this plan does consider that soil P levels are very high for several of the application fields. The plan recommends that P2O5 applications for Field 'G' be discontinued so that P concentration in the soil will be reduced over time. Also for all other fields P2O5 applications should be limited to removal rates so that soil P values do not continue to increase for fields that are in the high to very high range for Phosphorus.

Environmental Considerations for Managing Phosphorus:

Phosphorus (P) loading to surface water can accelerate Eutrophication. The availability of other nutrients and light penetration into the water column will also influence the response of water bodies to phosphorus. Factors such as: the amount of erosion and runoff, the form, amount, and distribution of phosphorus in the soil: and fertilizer and manure application rate, timing and placement determine P loss from agricultural fields and the resulting P loading to water resources. Most phosphorus compounds found in soils have low water solubility. Consequently, P loss from agricultural land was once thought to be primarily associated with soil erosion. In many cases, sediment-bound P is still the dominant form in which P losses from agricultural fields occur. Over the past decade, research has shown that phosphorus can be lost in runoff in dissolved forms. High dissolved P concentration in runoff is more frequently observed where soil P levels are high particularly near the soil surface. High soil P levels, however, do not automatically equate to high dissolved P in runoff. As stated earlier, numerous factors interact to create the potential for P losses from agricultural fields. Many of the basis processes that govern P transport are known.

The Tennessee P Index rates the application fields based on the following factors:

- Soil Test P
- P2O5 application rate (all sources)
- Form of Phosphorus applied
- Timing of Phosphorus applications
- Method of application
- Hydrological group rating of the soils in the application field.
- Buffer and Setback widths, slopes % and length, vegetative cover, and soil texture

According to the NRCS nutrient management standard, fields ranked in the MEDIUM risk category may receive organic (manure) or inorganic (commercial fertilizer) applications at nitrogen-based rates per the table below.

Total Points from P Index	*neralized Interpretation of P Index Points for the Site*
< 100	**LOW** potential for P movement from the field. If farming practices are maintained at the current level there is a low probability of an adverse impact to surface waters from P losses. Nitrogen-based nutrient management planning is satisfactory for this site. Soil P levels and P loss potential may increase in the future due to N-based nutrient management.
100 - 200	**MEDIUM** potential for P movement from the field. The chance for adverse impact to surface waters exists. *Nitrogen-based nutrient management planning may be satisfactory for this field when conservation measures are implemented to lessen the probability of P loss*. Soil P levels and P loss potential may increase in the future due to N-based nutrient management.
201 - 300	**HIGH** potential for P movement from the field. The chance for adverse impact to surface waters is likely unless remedial action is taken. Soil and water conservation practices are necessary (if practical) to reduce the risk of P movement and water quality degradation. If risk cannot be reduced, then a P-based nutrient management plan will be implemented.
> 301	**VERY HIGH** potential for P movement from the field and an adverse impact on surface waters. All necessary soil and water conservation practices, plus a P-based nutrient management plan must be put in place to avoid the potential for water quality degradation.

Tennessee Phosphorus Index

Field	Crop Year	Site and Transport Factor	Mgmt. and Source Factor	P Index w/o P Apps	P Index w/ P Apps	P Loss Risk
FSN 4-1	2012	8	17	32	136	Medium
FSN 4-1	2013	8	4	32	32	Low
FSN 4-1	2014	8	17	32	136	Medium
FSN 4-1	2015	8	4	32	32	Low
FSN 4-1	2016	8	17	32	136	Medium
FSN 4-2	2012	8	17	32	136	Medium
FSN 4-2	2013	8	4	32	32	Low
FSN 4-2	2014	8	17	32	136	Medium
FSN 4-2	2015	8	4	32	32	Low
FSN 4-2	2016	8	17	32	136	Medium
FSN 4-3	2012	6	4	24	24	Low
FSN 4-3	2013	6	17	24	102	Medium
FSN 4-3	2014	6	4	24	24	Low
FSN 4-3	2015	6	17	24	102	Medium

Field	Crop Year	Site and Transport Factor	Mgmt. and Source Factor	P Index w/o P Apps	P Index w/ P Apps	P Loss Risk
FSN 4-3	2016	6	4	24	24	Low
FSN 9-1	2012	8	14	8	112	Medium
FSN 9-1	2013	8	1	8	8	Low
FSN 9-1	2014	8	14	8	112	Medium
FSN 9-1	2015	8	1	8	8	Low
FSN 9-1	2016	8	14	8	112	Medium
FSN 10-1-2	2012	6	14	6	84	Low
FSN 10-1-2	2013	6	1	6	6	Low
FSN 10-1-2	2014	6	14	6	84	Low
FSN 10-1-2	2015	6	1	6	6	Low
FSN 10-1-2	2016	6	14	6	84	Low
FSN 79-1-2	2012	8	4	32	32	Low
FSN 79-1-2	2013	8	17	32	136	Medium
FSN 79-1-2	2014	8	4	32	32	Low
FSN 79-1-2	2015	8	17	32	136	Medium
FSN 79-1-2	2016	8	4	32	32	Low
FSN 79 3-4	2012	6	15	12	90	Low
FSN 79 3-4	2013	6	2	12	12	Low
FSN 79 3-4	2014	6	15	12	90	Low
FSN 79 3-4	2015	6	2	12	12	Low
FSN 79 3-4	2016	6	15	12	90	Low
FSN 97 1-2	2012	8	4	32	32	Low
FSN 97 1-2	2013	8	17	32	136	Medium
FSN 97 1-2	2014	8	4	32	32	Low
FSN 97 1-2	2015	8	17	32	136	Medium
FSN 97 1-2	2016	8	4	32	32	Low
FSN 122-1	2012	8	15	8	120	Medium
FSN 122-1	2013	8	1	8	8	Low
FSN 122-1	2014	8	15	8	120	Medium
FSN 122-1	2015	8	1	8	8	Low
FSN 122-1	2016	8	15	8	120	Medium
FSN 122-2	2012	8	15	8	120	Medium
FSN 122-2	2013	8	1	8	8	Low
FSN 122-2	2014	8	15	8	120	Medium
FSN 122-2	2015	8	1	8	8	Low
FSN 122-2	2016	8	15	8	120	Medium
FSN 122-3	2012	12	15	12	180	Medium
FSN 122-3	2013	12	1	12	12	Low
FSN 122-3	2014	12	15	12	180	Medium
FSN 122-3	2015	12	1	12	12	Low
FSN 122-3	2016	12	15	12	180	Medium

5.4. Additional Field Data Required by Risk Assessment Procedure

Field	Distance to Water (Feet)	Slope Length (Feet)	Buffer Width (Feet)	Tillage/Cover Type
FSN 4-1	1,000	100	40	No-till w/ heavy residues
FSN 4-2	800	100	40	No-till w/ heavy residues
FSN 4-3	1,000	200	40	No-till w/ heavy residues
FSN 9-1	150	100	40	No-till w/ heavy residues
FSN 10-1-2	1,500	200	40	No-till w/ heavy residues
FSN 79-1-2	200	200	40	No-till w/ heavy residues
FSN 79 3-4	350	200	40	No-till w/ heavy residues
FSN 97 1-2	900	200	40	No-till w/ heavy residues
FSN 122-1	225	200	40	No-till w/ heavy residues
FSN 122-2	500	50	40	No-till w/ heavy residues
FSN 122-3	200	100	40	No-till w/ heavy residues

Nitrogen Leaching Risk Assessment and Nitrogen Management:

Nitrogen Leaching potential was assessed for all the fields in this CNMP using the nationally accepted "Colorado Nitrogen Leaching Index Risk Assessment" tool.
The results are listed in a table on the following page. All of the fields have LOW ratings under the planned management for crops grown and nitrogen sources applied.

Permeability Class, irrigation methods and efficiencies, Manure effluent application rates, application timing and mitigating practices implemented were factors considered to make this determination.

The following practices are additional recommendations as part of an overall nutrient management plan to reduce nitrogen losses to groundwater by leaching.

1. Set realistic yield goals and consider University of Tennessee nitrogen recommendations for crops grown.
2. Properly sample lagoon effluent applied to determine actual Nitrogen and other plant nutrients being applied.
3. Apply nitrogen in split applications during the growing season to reduce leaching losses and improve plant utilization of nitrogen by supplying N nearer to the times when the plants need the most nitrogen, at green up in the spring and after hay harvests throughout the summer.
4. Take credit for nitrogen from **all** sources: previously grown legume crops, nitrogen contained in any fertilizer products applied, manure applications, etc.
5. Conduct a post-harvest evaluation of the nitrogen program:
    - Compare actual yields vs. yield goal;
    - Evaluate factors affecting yields and nitrogen use efficiency;
    - Consider using plant tissue sampling and nitrate tests to evaluate plant nitrogen sufficiency;
    - Refine nitrogen rates for future years.
6. Consider taking some deep soil tests in the spring to determine nitrogen availability & movement in the soil.
7. Review each nutrient management plan annually to determine if changes in the nutrient budget are needed.
8. Calibrate application equipment annually, at minimum, to ensure uniform distribution of material at planned rates.
9. Avoid applying nitrogen around environmentally sensitive areas such as sinkholes, wells, gullies, ditches, surface inlets, or rapidly permeable areas.
10. Observe all manure and effluent application setbacks and/of buffers for irrigation and other manures or compost applications.

NRCS National - Nitrogen Leaching Tool

Nitrogen Leaching Index Risk Assessment (Version 2.0)					
Factor	**Low (1)**	**Medium (2)**	**High (3)**	**Very High (4)**	**Score**
1.Permeability Class	**Very slow, slow, mod. slow**	**Moderate**	**Moderately rapid**	**Rapid and very rapid**	**1 to 3**
2. Irrigation Application Efficiency	**High >85%**	**Moderate 60-85%**	**Moderately Low 35 – 60%**	**Low , 35%**	**0**
3a. Nitrogen Application Rate (commercial N fertilizer with or without manure)	**Total N application below agronomic rate**	**Total N application rate equal to agronomic rate**	**Total N application rate is 1 to 50 lbs/acre above agronomic rate**	**Total N application rate is > 50 lbs/acre above agronomic rate**	**1**
3b. Manure or Litter Application Rate (no commercial N fertilizer)	**Applied at P agronomic rate**	**Applied at N agronomic rate**	**Applied above N agronomic rate**	**Applied above N agronomic rate more than one consecutive year.**	**2**
4. Application Timing	**In season split application (2 or more splits)**	**Any nitrogen application 0-3 months before crop planting**	**Any nitrogen application 3-5 months before crop planting**	**Any nitrogen application more than 5 months before crop planting**	**2**
GROSS SCORE (Sum of 1 thru 4)					**6 to 8**
5. Best Management Practice (BMP) Implementation Credits: Subtract 1 point for each of the following BMP's implemented in the field: <_Slow Release Fertilizers_>; <_Cover Crops_>; <_Nitrification Inhibitors_*>;<_Deep Rooted Crops in Rotation_>; <_Deep Soil Sampling to determine sub-soil N credit_>;					**2**
Net Score; (Sum of factors 1 thru 4 minus factor 5, BMP credits)					**4 to 6**

Net Score	Risk Interpretations
< 8	This field has a **LOW** risk for nitrogen leaching if management is maintained at the current level. If there is an underlying aquifer that is shallow (< 20 ft) or used locally as a public drinking water source, increase the risk to **MEDIUM**.
8 to 11	This field has a **MEDIUM** risk for nitrogen leaching and some management changes may be needed to decrease risk. Apply nitrogen at agronomic rates or lower using spring or split in-season applications. If there is an underlying aquifer that is shallow (< 20 ft) or used locally as a public drinking water source, increase the risk to **HIGH.**
12 to 15	This field has a **High**-risk for nitrogen leaching and management changes should be implemented to decrease risk. Manure should be applied at P agronomic rates. Apply nitrogen using split in-season applications at or below the agronomic rate. Changes in irrigation management and/or method may also be necessary. If there is an underlying aquifer that is shallow (< 20 ft) or used locally as a public drinking water source, increase the risk to **VERY HIGH**.
16	This field has a **VERY High**-risk for nitrogen leaching and management changes are needed to decrease risk. **Manure applications are NOT recommended**. Apply nitrogen using split in-season applications at or below the agronomic rate. Changes in irrigation management and/or method are necessary to protect ground water. Implement all appropriate BMPs.

Section 6. Nutrient Management

6.1. Field Information

Field ID	Sub-field ID	Total Acres	Spread-able Acres	County	Predominant Soil Type	Slope (%)	FSA Farm	FSA Tract	FSA Field
FSN 4-1		12.1	12.1	Bradley	Mv (Muse SIL)	5.0		4	
FSN 4-2		16.3	16.3	Bradley	Mv (Muse SIL)	5.0		4	
FSN 4-3		11.7	11.4	Bradley	Jb (Jefferson L)	3.0		4	
FSN 9-1		16.9	16.7	Bradley	Wd (Whitwell L)	2.0		9	
FSN 10-1-2		23.9	21.9	Bradley	Ec (Etowah SIL)	3.0		10	
FSN 79-1-2		21.9	17.0	Bradley	Wd (Whitwell L)	1.0		79	
FSN 79 3-4		26.2	24.0	Bradley	Sg (Staser L)	1.0		79	
FSN 97 1-2		19.1	11.7	Bradley	Sf (Sequoia SICL)	3.0		97	
FSN 122-1		4.9	4.9	Bradley	Mw (Muse SIL)	3.0		122	
FSN 122-2		3.5	3.3	Bradley	Ld (Lehew L)	10.0		122	
FSN 122-3		4.8	4.1	Bradley	Tn (Tyler SIL)	2.0		122	
Total Acres:		**161.3**	**143.4**						

OVERVIEW:
This Nutrient Management Plan conforms to the Tennessee NRCS 590 Standard Practice. Soils were sampled in August of 2011 and analyzed by University of Tennessee Soil and Plant Pest Center, 5201 Marchant Drive, Nashville, TN. Results are summarized in Table 6-3 and the Lab report is included in Section 4 with field maps.

P1, Phosphorus:
Soil Sample results indicated that Fields; 10-1, 2, 122-1, 2 & 3 are in the Low range (0-18lbs/acre), Field 9-1 Is in the Medium range (19-30 lbs/acre), Field 79-3,4 is in the High range (31-120 lbs/acre), and Fields 79-1, 2 & 97-1, 2 are in the Very High range (>121 lbs/acre) for soil Phosphorus (P). Litter applications of up to 3 tons per acre every 2 years are recommended, applied just previous to corn planting. Over time the litter applications recommended are expected to build soil P moderately but not increase the P risk above Medium. See Table 5-8, Projected P & K levels. (The Phosphorus Index, a measure of risk of phosphorus pollution, is rated Low to Medium for all fields for all years of the NMP.

K, Potassium:
Soil Sample results indicated that Fields 9 -1,10-1-2, 122-2 & 3 are in the Low range (0-90 lbs/acre), Fields 79-3-4 & 122-1 are in the Medium range (91-160 lbs/acre), Field 79-1-2 is in the High range (161-320 lbs/acre), and Field 97-1-2 is in the Very High range (>321lbs/acre) for soil Potassium (K). Litter applications of up to 3 tons per acre every 2 years are recommended, applied just previous to corn planting. Over time the manure applications recommended may not provide all the potassium needed to maintain soil K levels at optimum levels. Additional potash fertilizers may be needed on several fields in the future. See table 5-8, projected P & K levels.

pH: For maximum yields and soil fertility, it is recommended to maintain a soil pH of at least 6.0 for grass hay crops or without grass-clovers mixed stands. If water pH is 6.0 or less, liming material should be applied at UT recommended rates based Lime Chart #2 in Section 10. This chart can be read across the top is buffer value according to the soil test and down the side listed water pH of the soil. The recommended lime rate is at listed at the intersections of buffer values across the top of the chart, and water pH value, down the side of the chart.

Lime Recommendations:

Field Name	Tons/Acre	Field Name	Tons/Acre	Field Name	Tons/Acre
9-1	2.5	79-3-4	2	122-2	2.5
10-1-2	2	97-1-2	0	122-3	2
79-1-2	0	122-1	2		

Fields should be re-tested at least 6 months after lime is applied to re-evaluate pH.

Guidance in developing a nutrient budget may be obtained from your NRCS Field Office or your University of Tennessee Agricultural Extension Service Agent. Land application procedures must be planned and implemented in a way that minimizes potential adverse impacts to the environment and public health.

6.2. Manure Application Setback Distances

Setback Requirements: Class II CAFO

Feature	Setback Criteria	Setback Distance (Feet)
Streams	Applied upgradient, permanent vegetated setback >=35 feet	35
Streams	New operation, near high quality stream	60
Surface waters	Applied upgradient, permanent vegetated setback >=35 feet	35
Open tile line inlet structures	Applied upgradient, permanent vegetated setback >=35 feet	35
Sinkholes	Applied upgradient, permanent vegetated setback >=35 feet	35
Agricultural well heads	Applied upgradient, permanent vegetated setback >=35 feet	35
Other conduits to surface waters	Applied upgradient, permanent vegetated setback >=35 feet	35
Potable well, public or private	Application upgradient of feature	300
Potable well, public or private	Application down-gradient of feature	150

Source: TN DEQ Rule 1200-4-5-.14(17)(d) (http://www.state.tn.us/sos/rules/1200/1200-04/1200-04-05.pdf)

Setback Requirements: NRCS Standard

Feature	Setback Criteria	Setback Distance (Feet)
Well	Application upgradient of feature	300
Well	Application down-gradient of feature	150
Waterbody	Predominant slope <5% with good vegetation	30
Waterbody	Predominant slope 5 to 8% with good vegetation	50
Waterbody	Predominant slope >8%	100
Waterbody	Poor vegetation	100
Public road	All applications	50
Dwelling (other than producer)	All applications	300
Public use area	All applications	300
Property line	Application upgradient of feature	30

Source: Nutrient Management Standard 590
(http://efotg.nrcs.usda.gov/references/public/TN/Nutrient_Management_(590)_Standard.doc)

6.3. Soil Test Data

Field	Test Year	OM (%)	P Test Used	P	K	Mg	Ca	Units	Soil pH	Buffer pH	CEC (meq/ 100g)
FSN 4-1	2011		Mehlich-1	148	197	728	3,816	lbs/a	7.4		
FSN 4-2	2011		Mehlich-1	153	388	558	3,007	lbs/a	7.2		
FSN 4-3	2011		Mehlich-1	100	307	289	1,951	lbs/a	6.5		
FSN 9-1	2011		Mehlich-1	29	88	151	1,174	lbs/a	5.2	7.4	3.7
FSN 10-1-2	2011		Mehlich-1	8	83	1,057	204	lbs/a	5.6	7.6	5.0
FSN 79-1-2	2011		Mehlich-1	146	212	446	2,190	lbs/a	6.2	7.5	7.6
FSN 79 3-4	2011		Mehlich-1	43	144	1,591	275	lbs/a	5.8	7.5	7.5
FSN 97 1-2	2011		Mehlich-1	146	452	2,694	381	lbs/a	6.6		
FSN 122-1	2011		Mehlich-1	14	119	995	129	lbs/a	5.4	7.5	4.6
FSN 122-2	2011		Mehlich-1	8	61	1,253	105	lbs/a	5.3	7.5	5.6
FSN 122-3	2011		Mehlich-1	8	66	1,412	118	lbs/a	5.5	7.6	6.3

6.4. Manure Nutrient Analysis

Manure Source	Dry Matter (%)	Total N	NH_4-N	Total P_2O_5	Total K_2O	Avail. P_2O_5	Avail. K_2O	Units	Analysis Source and Date
Barn 1	75.2	44.4	0.0	30.2	43.1	30.2	43.1	Lb/Ton	Ag Diagnostic Lab, U of AR-Fayetteville 7/25/2011
Barn 2	57.6	35.4	0.0	32.1	38.5	32.1	38.5	Lb/Ton	Ag Diagnostic Lab, U of AR-Fayetteville 7/25/2011
Stackhouse	66.4	39.9	0.0	31.1	40.8	31.1	40.8	Lb/Ton	average of 2 houses, 7/25/2011

(1) Entered analysis may be the average of several individual analyses.

(2) Tennessee assumes that 100% of manure phosphorus and 100% of manure potassium is crop available. First-year per-acre nitrogen availability for individual manure applications is given in the Planned Nutrient Applications table. For more information about nitrogen availability in Tennessee, see "Manure Application Management," Tables 3 and 4, Tennessee Extension, PB1510, 2/94 (http://wastemgmt.ag.utk.edu/ExtensionProjects/extension_publications.htm).

6.5. Planned Crops and Fertilizer Recommendations

Field	Crop Year	Planned Crop	Yield Goal (per Acre)	N Rec (Lbs/A)	P_2O_5 Rec (Lbs/A)	K_2O Rec (Lbs/A)	N Removed (Lbs/A)	P_2O_5 Removed (Lbs/A)	K_2O Removed (Lbs/A)	Custom Fert. Rec. Source
FSN 4-1	2012	Corn grain	160.0 Bu	160	0	0	120	70	46	
FSN 4-1	2013	Small grain*	60.0 Bu	90	0	0	78	30	21	
FSN 4-1	2013	Soybean	45.0 Bu	0	0	0	180	36	63	
FSN 4-1	2014	Corn grain	160.0 Bu	160	0	0	120	70	46	
FSN 4-1	2015	Small grain*	60.0 Bu	90	0	0	78	30	21	
FSN 4-1	2015	Soybean	45.0 Bu	0	0	0	180	36	63	
FSN 4-1	2016	Corn grain	160.0 Bu	160	0	0	120	70	46	
FSN 4-2	2012	Corn grain	160.0 Bu	160	0	0	120	70	46	
FSN 4-2	2013	Small grain*	60.0 Bu	90	0	0	78	30	21	
FSN 4-2	2013	Soybean	45.0 Bu	0	0	0	180	36	63	
FSN 4-2	2014	Corn grain	160.0 Bu	160	0	0	120	70	46	
FSN 4-2	2015	Small grain*	60.0 Bu	90	0	0	78	30	21	
FSN 4-2	2015	Soybean	45.0 Bu	0	0	0	180	36	63	
FSN 4-2	2016	Corn grain	160.0 Bu	160	0	0	120	70	46	
FSN 4-3	2012	Small grain*	60.0 Bu	75	0	0	78	30	21	
FSN 4-3	2012	Soybean	45.0 Bu	0	0	0	180	36	63	
FSN 4-3	2013	Corn grain	160.0 Bu	160	0	0	120	70	46	
FSN 4-3	2014	Small grain*	60.0 Bu	90	0	0	78	30	21	
FSN 4-3	2014	Soybean	45.0 Bu	0	0	0	180	36	63	
FSN 4-3	2015	Corn grain	160.0 Bu	160	0	0	120	70	46	
FSN 4-3	2016	Small grain*	60.0 Bu	90	0	0	78	30	21	
FSN 4-3	2016	Soybean	45.0 Bu	0	0	0	180	36	63	
FSN 9-1	2012	Corn grain	150.0 Bu	130	60	120	113	66	44	
FSN 9-1	2013	Small grain*	60.0 Bu	90	40	40	78	30	21	
FSN 9-1	2013	Soybean	45.0 Bu	0	20	80	180	36	63	
FSN 9-1	2014	Corn grain	150.0 Bu	130	60	120	113	66	44	
FSN 9-1	2015	Small grain*	60.0 Bu	90	40	40	78	30	21	
FSN 9-1	2015	Soybean	45.0 Bu	0	20	80	180	36	63	
FSN 9-1	2016	Corn grain	150.0 Bu	130	60	120	113	66	44	

Field	Crop Year	Planned Crop	Yield Goal (per Acre)	N Rec (Lbs/A)	P_2O_5 Rec (Lbs/A)	K_2O Rec (Lbs/A)	N Removed (Lbs/A)	P_2O_5 Removed (Lbs/A)	K_2O Removed (Lbs/A)	Custom Fert. Rec. Source
FSN 10-1-2	2012	Corn grain	150.0 Bu	130	120	120	113	66	44	
FSN 10-1-2	2013	Small grain*	60.0 Bu	90	80	40	78	30	21	
FSN 10-1-2	2013	Soybean	45.0 Bu	0	10	80	180	36	63	
FSN 10-1-2	2014	Corn grain	150.0 Bu	130	120	120	113	66	44	
FSN 10-1-2	2015	Small grain*	60.0 Bu	90	80	40	78	30	21	
FSN 10-1-2	2015	Soybean	45.0 Bu	0	10	80	180	36	63	
FSN 10-1-2	2016	Corn grain	150.0 Bu	130	120	120	113	66	44	
FSN 79-1-2	2012	Small grain*	60.0 Bu	75	0	0	78	30	21	
FSN 79-1-2	2012	Soybean	45.0 Bu	0	0	0	180	36	63	
FSN 79-1-2	2013	Corn grain	150.0 Bu	130	0	0	113	66	44	
FSN 79-1-2	2014	Small grain*	60.0 Bu	90	0	0	78	30	21	
FSN 79-1-2	2014	Soybean	45.0 Bu	0	0	0	180	36	63	
FSN 79-1-2	2015	Corn grain	150.0 Bu	130	0	0	113	66	44	
FSN 79-1-2	2016	Small grain*	60.0 Bu	90	0	0	78	30	21	
FSN 79-1-2	2016	Soybean	45.0 Bu	0	0	0	180	36	63	
FSN 79 3-4	2012	Corn grain	150.0 Bu	130	0	60	113	66	44	
FSN 79 3-4	2013	Small grain*	60.0 Bu	90	0	20	78	30	21	
FSN 79 3-4	2013	Soybean	45.0 Bu	0	0	40	180	36	63	
FSN 79 3-4	2014	Corn grain	150.0 Bu	130	0	60	113	66	44	
FSN 79 3-4	2015	Small grain*	60.0 Bu	90	0	20	78	30	21	
FSN 79 3-4	2015	Soybean	45.0 Bu	0	0	40	180	36	63	
FSN 79 3-4	2016	Corn grain	150.0 Bu	130	0	60	113	66	44	
FSN 97 1-2	2012	Small grain*	60.0 Bu	75	0	0	78	30	21	
FSN 97 1-2	2012	Soybean	45.0 Bu	0	0	0	180	36	63	
FSN 97 1-2	2013	Corn grain	150.0 Bu	130	0	0	113	66	44	
FSN 97 1-2	2014	Small grain*	60.0 Bu	90	0	0	78	30	21	
FSN 97 1-2	2014	Soybean	45.0 Bu	0	0	0	180	36	63	
FSN 97 1-2	2015	Corn grain	150.0 Bu	130	0	0	113	66	44	
FSN 97 1-2	2016	Small grain*	60.0 Bu	90	0	0	78	30	21	
FSN 97 1-2	2016	Soybean	45.0 Bu	0	0	0	180	36	63	

Field	Crop Year	Planned Crop	Yield Goal (per Acre)	N Rec (Lbs/A)	P_2O_5 Rec (Lbs/A)	K_2O Rec (Lbs/A)	N Removed (Lbs/A)	P_2O_5 Removed (Lbs/A)	K_2O Removed (Lbs/A)	Custom Fert. Rec. Source
FSN 122-1	2012	Corn grain	150.0 Bu	130	120	60	113	66	44	
FSN 122-1	2013	Small grain*	60.0 Bu	90	80	20	78	30	21	
FSN 122-1	2013	Soybean	45.0 Bu	0	10	40	180	36	63	
FSN 122-1	2014	Corn grain	150.0 Bu	130	120	60	113	66	44	
FSN 122-1	2015	Small grain*	60.0 Bu	90	80	20	78	30	21	
FSN 122-1	2015	Soybean	45.0 Bu	0	10	40	180	36	63	
FSN 122-1	2016	Corn grain	150.0 Bu	130	120	60	113	66	44	
FSN 122-2	2012	Corn grain	150.0 Bu	130	120	120	113	66	44	
FSN 122-2	2013	Small grain*	60.0 Bu	90	80	40	78	30	21	
FSN 122-2	2013	Soybean	45.0 Bu	0	10	80	180	36	63	
FSN 122-2	2014	Corn grain	150.0 Bu	130	120	120	113	66	44	
FSN 122-2	2015	Small grain*	60.0 Bu	90	80	40	78	30	21	
FSN 122-2	2015	Soybean	45.0 Bu	0	10	80	180	36	63	
FSN 122-2	2016	Corn grain	150.0 Bu	130	120	120	113	66	44	
FSN 122-3	2012	Corn grain	150.0 Bu	130	120	120	113	66	44	
FSN 122-3	2013	Small grain*	60.0 Bu	90	80	40	78	30	21	
FSN 122-3	2013	Soybean	45.0 Bu	0	10	80	180	36	63	
FSN 122-3	2014	Corn grain	150.0 Bu	130	120	120	113	66	44	
FSN 122-3	2015	Small grain*	60.0 Bu	90	80	40	78	30	21	
FSN 122-3	2015	Soybean	45.0 Bu	0	10	80	180	36	63	
FSN 122-3	2016	Corn grain	150.0 Bu	130	120	120	113	66	44	

* Unharvested cover crop or first crop in double-crop system.
[a] Custom fertilizer recommendation.

6.6. Manure Application Planning Calendar – January 2012 through December 2012, (number of loads applied)

Field	Total Acres	Spread. Acres	Predominant Soil Type	Primary 2012 Crop (Prev. Primary Crop)	Jan '12	Feb '12	Mar '12	Apr '12	May '12	Jun '12	Jul '12	Aug '12	Sep '12	Oct '12	Nov '12	Dec '12
FSN 4-1	12.1	12.1	Muse SIL (Mv 5-12%)	Corn grain (Soybean)				5.2								
FSN 4-2	16.3	16.3	Muse SIL (Mv 5-12%)	Corn grain (Soybean)				7.0								
FSN 4-3	11.7	11.4	Jefferson L (Jb 2-5%)	Soybean (Corn grain)												
FSN 9-1	16.9	16.7	Whitwell L (Wd 0-3%)	Corn grain (Soybean)				7.2								
FSN 10-1-2	23.9	21.9	Etowah SIL (Ec 2-5%)	Corn grain (Soybean)				9.4								
FSN 79-1-2	21.9	17.0	Whitwell L (Wd 0-3%)	Soybean (Corn grain)												
FSN 79 3-4	26.2	24.0	Staser L (Sg 0-3%)	Corn grain (Soybean)				10.3								
FSN 97 1-2	19.1	11.7	Sequoia SICL (Sf 2-5%)	Soybean (Corn grain)												
FSN 122-1	4.9	4.9	Muse SIL (Mw 2-5%)	Corn grain (Soybean)				2.2								
FSN 122-2	3.5	3.3	Lehew L (Ld 12-25%)	Corn grain (Soybean)				1.5								
FSN 122-3	4.8	4.1	Tyler SIL (Tn 0-3%)	Corn grain (Soybean)				1.8								
Total	*161.3*	*143.4*						*44.6*								

Crop in field

No. indicates total loads
"X" indicates other manure apps

Manure Application Planning Calendar – January 2013 through December 2013, (number of loads applied)

Field	Total Acres	Spread. Acres	Predominant Soil Type	Primary 2013 Crop (Prev. Primary Crop)	Jan '13	Feb '13	Mar '13	Apr '13	May '13	Jun '13	Jul '13	Aug '13	Sep '13	Oct '13	Nov '13	Dec '13
FSN 4-1	12.1	12.1	Muse SIL (Mv 5-12%)	Soybean (Corn grain)												
FSN 4-2	16.3	16.3	Muse SIL (Mv 5-12%)	Soybean (Corn grain)												
FSN 4-3	11.7	11.4	Jefferson L (Jb 2-5%)	Corn grain (Soybean)				4.9								
FSN 9-1	16.9	16.7	Whitwell L (Wd 0-3%)	Soybean (Corn grain)												
FSN 10-1-2	23.9	21.9	Etowah SIL (Ec 2-5%)	Soybean (Corn grain)												
FSN 79-1-2	21.9	17.0	Whitwell L (Wd 0-3%)	Corn grain (Soybean)				7.3								
FSN 79 3-4	26.2	24.0	Staser L (Sg 0-3%)	Soybean (Corn grain)												
FSN 97 1-2	19.1	11.7	Sequoia SICL (Sf 2-5%)	Corn grain (Soybean)				5.1								
FSN 122-1	4.9	4.9	Muse SIL (Mw 2-5%)	Soybean (Corn grain)												
FSN 122-2	3.5	3.3	Lehew L (Ld 12-25%)	Soybean (Corn grain)												
FSN 122-3	4.8	4.1	Tyler SIL (Tn 0-3%)	Soybean (Corn grain)												
Total	*161.3*	*143.4*						*17.3*								

Crop in field

No. indicates total loads
"X" indicates other manure apps

Manure Application Planning Calendar – January 2014 through December 2014, (number of loads applied)

Field	Total Acres	Spread. Acres	Predominant Soil Type	Primary 2014 Crop (Prev. Primary Crop)	Jan '14	Feb '14	Mar '14	Apr '14	May '14	Jun '14	Jul '14	Aug '14	Sep '14	Oct '14	Nov '14	Dec '14
FSN 4-1	12.1	12.1	Muse SIL (Mv 5-12%)	Corn grain (Soybean)				5.2								
FSN 4-2	16.3	16.3	Muse SIL (Mv 5-12%)	Corn grain (Soybean)				7.0								
FSN 4-3	11.7	11.4	Jefferson L (Jb 2-5%)	Soybean (Corn grain)												
FSN 9-1	16.9	16.7	Whitwell L (Wd 0-3%)	Corn grain (Soybean)				7.2								
FSN 10-1-2	23.9	21.9	Etowah SIL (Ec 2-5%)	Corn grain (Soybean)				9.4								
FSN 79-1-2	21.9	17.0	Whitwell L (Wd 0-3%)	Soybean (Corn grain)												
FSN 79 3-4	26.2	24.0	Staser L (Sg 0-3%)	Corn grain (Soybean)				10.3								
FSN 97 1-2	19.1	11.7	Sequoia SICL (Sf 2-5%)	Soybean (Corn grain)												
FSN 122-1	4.9	4.9	Muse SIL (Mw 2-5%)	Corn grain (Soybean)				2.2								
FSN 122-2	3.5	3.3	Lehew L (Ld 12-25%)	Corn grain (Soybean)				1.5								
FSN 122-3	4.8	4.1	Tyler SIL (Tn 0-3%)	Corn grain (Soybean)				1.8								
Total	*161.3*	*143.4*						*44.6*								

Crop in field

No. indicates total loads
"X" indicates other manure apps

Manure Application Planning Calendar – January 2015 through December 2015, (number of loads applied)

Field	Total Acres	Spread. Acres	Predominant Soil Type	Primary 2015 Crop (Prev. Primary Crop)	Jan '15	Feb '15	Mar '15	Apr '15	May '15	Jun '15	Jul '15	Aug '15	Sep '15	Oct '15	Nov '15	Dec '15
FSN 4-1	12.1	12.1	Muse SIL (Mv 5-12%)	Soybean (Corn grain)												
FSN 4-2	16.3	16.3	Muse SIL (Mv 5-12%)	Soybean (Corn grain)												
FSN 4-3	11.7	11.4	Jefferson L (Jb 2-5%)	Corn grain (Soybean)				4.9								
FSN 9-1	16.9	16.7	Whitwell L (Wd 0-3%)	Soybean (Corn grain)												
FSN 10-1-2	23.9	21.9	Etowah SIL (Ec 2-5%)	Soybean (Corn grain)												
FSN 79-1-2	21.9	17.0	Whitwell L (Wd 0-3%)	Corn grain (Soybean)				7.3								
FSN 79 3-4	26.2	24.0	Staser L (Sg 0-3%)	Soybean (Corn grain)												
FSN 97 1-2	19.1	11.7	Sequoia SICL (Sf 2-5%)	Corn grain (Soybean)				5.1								
FSN 122-1	4.9	4.9	Muse SIL (Mw 2-5%)	Soybean (Corn grain)												
FSN 122-2	3.5	3.3	Lehew L (Ld 12-25%)	Soybean (Corn grain)												
FSN 122-3	4.8	4.1	Tyler SIL (Tn 0-3%)	Soybean (Corn grain)												
Total	*161.3*	*143.4*						*17.3*								

Crop in field

No. indicates total loads
"X" indicates other manure apps

Manure Application Planning Calendar – January 2016 through December 2016, (number of loads applied)

Field	Total Acres	Spread. Acres	Predominant Soil Type	Primary 2016 Crop (Prev. Primary Crop)	Jan '16	Feb '16	Mar '16	Apr '16	May '16	Jun '16	Jul '16	Aug '16	Sep '16	Oct '16	Nov '16	Dec '16
FSN 4-1	12.1	12.1	Muse SIL (Mv 5-12%)	Corn grain (Soybean)				5.2								
FSN 4-2	16.3	16.3	Muse SIL (Mv 5-12%)	Corn grain (Soybean)				7.0								
FSN 4-3	11.7	11.4	Jefferson L (Jb 2-5%)	Soybean (Corn grain)												
FSN 9-1	16.9	16.7	Whitwell L (Wd 0-3%)	Corn grain (Soybean)				7.2								
FSN 10-1-2	23.9	21.9	Etowah SIL (Ec 2-5%)	Corn grain (Soybean)				9.4								
FSN 79-1-2	21.9	17.0	Whitwell L (Wd 0-3%)	Soybean (Corn grain)												
FSN 79 3-4	26.2	24.0	Staser L (Sg 0-3%)	Corn grain (Soybean)				10.3								
FSN 97 1-2	19.1	11.7	Sequoia SICL (Sf 2-5%)	Soybean (Corn grain)												
FSN 122-1	4.9	4.9	Muse SIL (Mw 2-5%)	Corn grain (Soybean)				2.2								
FSN 122-2	3.5	3.3	Lehew L (Ld 12-25%)	Corn grain (Soybean)				1.5								
FSN 122-3	4.8	4.1	Tyler SIL (Tn 0-3%)	Corn grain (Soybean)				1.8								
Total	*161.3*	*143.4*						*44.6*								

Crop in field

No. indicates total loads
"X" indicates other manure apps

6.7. Planned Nutrient Applications (Manure-spreadable Area)

Field	App. Month	Target Crop	Nutrient Source	Application Method	Rate Basis	Rate/Acre	Loads, Speed or Time	Total Amount Applied	Acres Cov.	Avail N (Lbs/A)	Avail P_2O_5 (Lbs/A)	Avail K_2O (Lbs/A)
FSN 4-1	Apr 2012	Corn grain	Stackhouse	Litter truck, incorp. w/in 1 day(s)	Custom	3 Ton	5.2 Lds	36.4 Ton	12.1	60	93	122
FSN 4-1	May 2012	Corn grain	28-0-0	Surface broadcast	Custom	32 Gal		387 Gal	12.1	96	0	0
FSN 4-1	Mar 2013	Small grain	46-0-0	Surface broadcast	Custom	150 Lbs		1,815 Lbs	12.1	69	0	0
FSN 4-1	Apr 2014	Corn grain	Stackhouse	Litter truck, incorp. w/in 1 day(s)	Custom	3 Ton	5.2 Lds	36.4 Ton	12.1	60	93	122
FSN 4-1	May 2014	Corn grain	28-0-0	Surface broadcast	Custom	30 Gal		363 Gal	12.1	90	0	0
FSN 4-1	Mar 2015	Small grain	46-0-0	Surface broadcast	Custom	150 Lbs		1,815 Lbs	12.1	69	0	0
FSN 4-1	Apr 2016	Corn grain	Stackhouse	Litter truck, incorp. w/in 1 day(s)	Custom	3 Ton	5.2 Lds	36.4 Ton	12.1	60	93	122
FSN 4-1	May 2016	Corn grain	28-0-0	Surface broadcast	Custom	30 Gal		363 Gal	12.1	90	0	0
FSN 4-2	Apr 2012	Corn grain	Stackhouse	Litter truck, incorp. w/in 1 day(s)	Custom	3 Ton	7 Lds	49 Ton	16.3	60	93	122
FSN 4-2	May 2012	Corn grain	28-0-0	Surface broadcast	Custom	32 Gal		522 Gal	16.3	96	0	0
FSN 4-2	Mar 2013	Small grain	46-0-0	Surface broadcast	Custom	150 Lbs		2,445 Lbs	16.3	69	0	0
FSN 4-2	Apr 2014	Corn grain	Stackhouse	Litter truck, incorp. w/in 1 day(s)	Custom	3 Ton	7 Lds	49 Ton	16.3	60	93	122
FSN 4-2	May 2014	Corn grain	28-0-0	Surface broadcast	Custom	30 Gal		489 Gal	16.3	90	0	0
FSN 4-2	Mar 2015	Small grain	46-0-0	Surface broadcast	Custom	150 Lbs		2,445 Lbs	16.3	69	0	0
FSN 4-2	Apr 2016	Corn grain	Stackhouse	Litter truck, incorp. w/in 1 day(s)	Custom	3 Ton	7 Lds	49 Ton	16.3	60	93	122
FSN 4-2	May 2016	Corn grain	28-0-0	Surface broadcast	Custom	30 Gal		489 Gal	16.3	90	0	0
FSN 4-3	Mar 2012	Small grain	46-0-0	Surface broadcast	Custom	150 Lbs		1,710 Lbs	11.4	69	0	0
FSN 4-3	Apr 2013	Corn grain	Stackhouse	Litter truck, incorp. w/in 1 day(s)	Custom	3 Ton	4.9 Lds	34.3 Ton	11.4	60	93	122
FSN 4-3	Mar 2014	Small grain	46-0-0	Surface broadcast	Custom	150 Lbs		1,710 Lbs	11.4	69	0	0
FSN 4-3	Apr 2015	Corn grain	Stackhouse	Litter truck, incorp. w/in 1 day(s)	Custom	3 Ton	4.9 Lds	34.3 Ton	11.4	60	93	122
FSN 4-3	May 2015	Corn grain	28-0-0	Surface broadcast	Custom	30 Gal		342 Gal	11.4	90	0	0
FSN 4-3	Mar 2016	Small grain	46-0-0	Surface broadcast	Custom	150 Lbs		1,710 Lbs	11.4	69	0	0
FSN 9-1	Apr 2012	Corn grain	Stackhouse	Litter truck, incorp. w/in 1 day(s)	Custom	3 Ton	7.2 Lds	50.4 Ton	16.8	60	93	122
FSN 9-1	May 2012	Corn grain	28-0-0	Surface broadcast	Custom	22 Gal		367 Gal	16.7	66	0	0
FSN 9-1	Mar 2013	Small grain	46-0-0	Surface broadcast	Custom	150 Lbs		2,505 Lbs	16.7	69	0	0
FSN 9-1	Apr 2014	Corn grain	Stackhouse	Litter truck, incorp. w/in 1 day(s)	Custom	3 Ton	7.2 Lds	50.4 Ton	16.8	60	93	122
FSN 9-1	May 2014	Corn grain	28-0-0	Surface broadcast	Custom	20 Gal		334 Gal	16.7	60	0	0
FSN 9-1	Mar 2015	Small grain	46-0-0	Surface broadcast	Custom	150 Lbs		2,505 Lbs	16.7	69	0	0
FSN 9-1	Apr 2016	Corn grain	Stackhouse	Litter truck, incorp. w/in 1 day(s)	Custom	3 Ton	7.2 Lds	50.4 Ton	16.8	60	93	122

Field	App. Month	Target Crop	Nutrient Source	Application Method	Rate Basis	Rate/Acre	Loads, Speed or Time	Total Amount Applied	Acres Cov.	Avail N (Lbs/A)	Avail P_2O_5 (Lbs/A)	Avail K_2O (Lbs/A)
FSN 9-1	May 2016	Corn grain	28-0-0	Surface broadcast	Custom	20 Gal		334 Gal	16.7	60	0	0
FSN 10-1-2	Apr 2012	Corn grain	Stackhouse	Litter truck, incorp. w/in 1 day(s)	Custom	3 Ton	9.4 Lds	65.8 Ton	21.9	60	93	122
FSN 10-1-2	May 2012	Corn grain	28-0-0	Surface broadcast	Custom	22 Gal		482 Gal	21.9	66	0	0
FSN 10-1-2	Mar 2013	Small grain	46-0-0	Surface broadcast	Custom	150 Lbs		3,285 Lbs	21.9	69	0	0
FSN 10-1-2	Apr 2014	Corn grain	Stackhouse	Litter truck, incorp. w/in 1 day(s)	Custom	3 Ton	9.4 Lds	65.8 Ton	21.9	60	93	122
FSN 10-1-2	May 2014	Corn grain	28-0-0	Surface broadcast	Custom	20 Gal		438 Gal	21.9	60	0	0
FSN 10-1-2	Mar 2015	Small grain	46-0-0	Surface broadcast	Custom	150 Lbs		3,285 Lbs	21.9	69	0	0
FSN 10-1-2	Apr 2016	Corn grain	Stackhouse	Litter truck, incorp. w/in 1 day(s)	Custom	3 Ton	9.4 Lds	65.8 Ton	21.9	60	93	122
FSN 10-1-2	May 2016	Corn grain	28-0-0	Surface broadcast	Custom	20 Gal		438 Gal	21.9	60	0	0
FSN 79-1-2	Mar 2012	Small grain	46-0-0	Surface broadcast	Custom	150 Lbs		2,550 Lbs	17.0	69	0	0
FSN 79-1-2	Apr 2013	Corn grain	Stackhouse	Litter truck, incorp. w/in 1 day(s)	Custom	3 Ton	7.3 Lds	51.1 Ton	17.0	60	93	122
FSN 79-1-2	Mar 2014	Small grain	46-0-0	Surface broadcast	Custom	150 Lbs		2,550 Lbs	17.0	69	0	0
FSN 79-1-2	Apr 2015	Corn grain	Stackhouse	Litter truck, incorp. w/in 1 day(s)	Custom	3 Ton	7.3 Lds	51.1 Ton	17.0	60	93	122
FSN 79-1-2	May 2015	Corn grain	28-0-0	Surface broadcast	Custom	20 Gal		340 Gal	17.0	60	0	0
FSN 79-1-2	Mar 2016	Small grain	46-0-0	Surface broadcast	Custom	150 Lbs		2,550 Lbs	17.0	69	0	0
FSN 79 3-4	Apr 2012	Corn grain	Stackhouse	Litter truck, incorp. w/in 1 day(s)	Custom	3 Ton	10.3 Lds	72.1 Ton	24.0	60	93	122
FSN 79 3-4	May 2012	Corn grain	28-0-0	Surface broadcast	Custom	22 Gal		528 Gal	24.0	66	0	0
FSN 79 3-4	Mar 2013	Small grain	46-0-0	Surface broadcast	Custom	150 Lbs		3,600 Lbs	24.0	69	0	0
FSN 79 3-4	Apr 2014	Corn grain	Stackhouse	Litter truck, incorp. w/in 1 day(s)	Custom	3 Ton	10.3 Lds	72.1 Ton	24.0	60	93	122
FSN 79 3-4	May 2014	Corn grain	28-0-0	Surface broadcast	Custom	20 Gal		480 Gal	24.0	60	0	0
FSN 79 3-4	Mar 2015	Small grain	46-0-0	Surface broadcast	Custom	150 Lbs		3,600 Lbs	24.0	69	0	0
FSN 79 3-4	Apr 2016	Corn grain	Stackhouse	Litter truck, incorp. w/in 1 day(s)	Custom	3 Ton	10.3 Lds	72.1 Ton	24.0	60	93	122
FSN 79 3-4	May 2016	Corn grain	28-0-0	Surface broadcast	Custom	20 Gal		480 Gal	24.0	60	0	0
FSN 97 1-2	Mar 2012	Small grain	46-0-0	Surface broadcast	Custom	150 Lbs		1,755 Lbs	11.7	69	0	0
FSN 97 1-2	Apr 2013	Corn grain	Stackhouse	Litter truck, incorp. w/in 1 day(s)	Custom	3 Ton	5.1 Lds	35.7 Ton	11.9	60	93	122
FSN 97 1-2	Mar 2014	Small grain	46-0-0	Surface broadcast	Custom	150 Lbs		1,755 Lbs	11.7	69	0	0
FSN 97 1-2	Apr 2015	Corn grain	Stackhouse	Litter truck, incorp. w/in 1 day(s)	Custom	3 Ton	5.1 Lds	35.7 Ton	11.9	60	93	122
FSN 97 1-2	May 2015	Corn grain	28-0-0	Surface broadcast	Custom	20 Gal		234 Gal	11.7	60	0	0
FSN 97 1-2	Mar 2016	Small grain	46-0-0	Surface broadcast	Custom	150 Lbs		1,755 Lbs	11.7	69	0	0
FSN 122-1	Apr 2012	Corn grain	Stackhouse	Litter truck, incorp. w/in 1 day(s)	Custom	3 Ton	2.2 Lds	15.4 Ton	5.1	60	93	122

Field	App. Month	Target Crop	Nutrient Source	Application Method	Rate Basis	Rate/Acre	Loads, Speed or Time	Total Amount Applied	Acres Cov.	Avail N (Lbs/A)	Avail P_2O_5 (Lbs/A)	Avail K_2O (Lbs/A)
FSN 122-1	May 2012	Corn grain	28-0-0	Surface broadcast	Custom	22 Gal		108 Gal	4.9	66	0	0
FSN 122-1	Mar 2013	Small grain	46-0-0	Surface broadcast	Custom	150 Lbs		735 Lbs	4.9	69	0	0
FSN 122-1	Apr 2014	Corn grain	Stackhouse	Litter truck, incorp. w/in 1 day(s)	Custom	3 Ton	2.2 Lds	15.4 Ton	5.1	60	93	122
FSN 122-1	May 2014	Corn grain	28-0-0	Surface broadcast	Custom	20 Gal		98 Gal	4.9	60	0	0
FSN 122-1	Mar 2015	Small grain	46-0-0	Surface broadcast	Custom	150 Lbs		735 Lbs	4.9	69	0	0
FSN 122-1	Apr 2016	Corn grain	Stackhouse	Litter truck, incorp. w/in 1 day(s)	Custom	3 Ton	2.2 Lds	15.4 Ton	5.1	60	93	122
FSN 122-1	May 2016	Corn grain	28-0-0	Surface broadcast	Custom	20 Gal		98 Gal	4.9	60	0	0
FSN 122-2	Apr 2012	Corn grain	Stackhouse	Litter truck, incorp. w/in 1 day(s)	Custom	3 Ton	1.5 Lds	10.5 Ton	3.5	60	93	122
FSN 122-2	May 2012	Corn grain	28-0-0	Surface broadcast	Custom	20 Gal		66 Gal	3.3	60	0	0
FSN 122-2	Mar 2013	Small grain	46-0-0	Surface broadcast	Custom	150 Lbs		495 Lbs	3.3	69	0	0
FSN 122-2	Apr 2014	Corn grain	Stackhouse	Litter truck, incorp. w/in 1 day(s)	Custom	3 Ton	1.5 Lds	10.5 Ton	3.5	60	93	122
FSN 122-2	May 2014	Corn grain	28-0-0	Surface broadcast	Custom	18 Gal		59 Gal	3.3	54	0	0
FSN 122-2	Mar 2015	Small grain	46-0-0	Surface broadcast	Custom	150 Lbs		495 Lbs	3.3	69	0	0
FSN 122-2	Apr 2016	Corn grain	Stackhouse	Litter truck, incorp. w/in 1 day(s)	Custom	3 Ton	1.5 Lds	10.5 Ton	3.5	60	93	122
FSN 122-2	May 2016	Corn grain	28-0-0	Surface broadcast	Custom	18 Gal		59 Gal	3.3	54	0	0
FSN 122-3	Apr 2012	Corn grain	Stackhouse	Litter truck, incorp. w/in 1 day(s)	Custom	3 Ton	1.8 Lds	12.6 Ton	4.2	60	93	122
FSN 122-3	May 2012	Corn grain	28-0-0	Surface broadcast	Custom	22 Gal		90 Gal	4.1	66	0	0
FSN 122-3	Mar 2013	Small grain	46-0-0	Surface broadcast	Custom	150 Lbs		615 Lbs	4.1	69	0	0
FSN 122-3	Apr 2014	Corn grain	Stackhouse	Litter truck, incorp. w/in 1 day(s)	Custom	3 Ton	1.8 Lds	12.6 Ton	4.2	60	93	122
FSN 122-3	May 2014	Corn grain	28-0-0	Surface broadcast	Custom	20 Gal		82 Gal	4.1	60	0	0
FSN 122-3	Mar 2015	Small grain	46-0-0	Surface broadcast	Custom	150 Lbs		615 Lbs	4.1	69	0	0
FSN 122-3	Apr 2016	Corn grain	Stackhouse	Litter truck, incorp. w/in 1 day(s)	Custom	3 Ton	1.8 Lds	12.6 Ton	4.2	60	93	122
FSN 122-3	May 2016	Corn grain	28-0-0	Surface broadcast	Custom	20 Gal		82 Gal	4.1	60	0	0

Planned Nutrient Applications (Non-manure-spreadable Area)

Field	App. Month	Target Crop	Nutrient Source	Application Method	Rate Basis	Rate/Acre	Total Amount Applied	Acres Cov.	Avail N (Lbs/A)	Avail P_2O_5 (Lbs/A)	Avail K_2O (Lbs/A)
FSN 4-3	Mar 2012	Small grain	46-0-0	Surface broadcast	Custom	150 Lbs	45 Lbs	0.3	69	0	0
FSN 4-3	Mar 2014	Small grain	46-0-0	Surface broadcast	Custom	180 Lbs	54 Lbs	0.3	83	0	0
FSN 4-3	May 2015	Corn grain	28-0-0	Surface broadcast	Custom	52 Gal	16 Gal	0.3	155	0	0
FSN 4-3	Mar 2016	Small grain	46-0-0	Surface broadcast	Custom	180 Lbs	54 Lbs	0.3	83	0	0
FSN 9-1	May 2012	Corn grain	28-0-0	Surface broadcast	Custom	42 Gal	8 Gal	0.2	125	0	0
FSN 9-1	Mar 2013	Small grain	46-0-0	Surface broadcast	Custom	180 Lbs	36 Lbs	0.2	83	0	0
FSN 9-1	May 2014	Corn grain	28-0-0	Surface broadcast	Custom	42 Gal	8 Gal	0.2	125	0	0
FSN 9-1	Mar 2015	Small grain	46-0-0	Surface broadcast	Custom	180 Lbs	36 Lbs	0.2	83	0	0
FSN 9-1	May 2016	Corn grain	28-0-0	Surface broadcast	Custom	42 Gal	8 Gal	0.2	125	0	0
FSN 10-1-2	May 2012	Corn grain	28-0-0	Surface broadcast	Custom	42 Gal	84 Gal	2.0	125	0	0
FSN 10-1-2	Mar 2013	Small grain	46-0-0	Surface broadcast	Custom	180 Lbs	360 Lbs	2.0	83	0	0
FSN 10-1-2	May 2014	Corn grain	28-0-0	Surface broadcast	Custom	42 Gal	84 Gal	2.0	125	0	0
FSN 10-1-2	Mar 2015	Small grain	46-0-0	Surface broadcast	Custom	180 Lbs	360 Lbs	2.0	83	0	0
FSN 10-1-2	May 2016	Corn grain	28-0-0	Surface broadcast	Custom	42 Gal	84 Gal	2.0	125	0	0
FSN 79-1-2	Mar 2012	Small grain	46-0-0	Surface broadcast	Custom	150 Lbs	735 Lbs	4.9	69	0	0
FSN 79-1-2	Mar 2014	Small grain	46-0-0	Surface broadcast	Custom	180 Lbs	882 Lbs	4.9	83	0	0
FSN 79-1-2	May 2015	Corn grain	28-0-0	Surface broadcast	Custom	42 Gal	206 Gal	4.9	125	0	0
FSN 79-1-2	Mar 2016	Small grain	46-0-0	Surface broadcast	Custom	180 Lbs	882 Lbs	4.9	83	0	0
FSN 79 3-4	May 2012	Corn grain	28-0-0	Surface broadcast	Custom	42 Gal	92 Gal	2.2	125	0	0
FSN 79 3-4	Mar 2013	Small grain	46-0-0	Surface broadcast	Custom	180 Lbs	396 Lbs	2.2	83	0	0
FSN 79 3-4	May 2014	Corn grain	28-0-0	Surface broadcast	Custom	42 Gal	92 Gal	2.2	125	0	0
FSN 79 3-4	Mar 2015	Small grain	46-0-0	Surface broadcast	Custom	180 Lbs	396 Lbs	2.2	83	0	0
FSN 79 3-4	May 2016	Corn grain	28-0-0	Surface broadcast	Custom	42 Gal	92 Gal	2.2	125	0	0
FSN 97 1-2	Mar 2012	Small grain	46-0-0	Surface broadcast	Custom	150 Lbs	1,110 Lbs	7.4	69	0	0
FSN 97 1-2	Mar 2014	Small grain	46-0-0	Surface broadcast	Custom	180 Lbs	1,332 Lbs	7.4	83	0	0
FSN 97 1-2	May 2015	Corn grain	28-0-0	Surface broadcast	Custom	42 Gal	311 Gal	7.4	125	0	0
FSN 97 1-2	Mar 2016	Small grain	46-0-0	Surface broadcast	Custom	180 Lbs	1,332 Lbs	7.4	83	0	0
FSN 122-2	May 2012	Corn grain	28-0-0	Surface broadcast	Custom	42 Gal	8 Gal	0.2	125	0	0
FSN 122-2	Mar 2013	Small grain	46-0-0	Surface broadcast	Custom	180 Lbs	36 Lbs	0.2	83	0	0

Field	App. Month	Target Crop	Nutrient Source	Application Method	Rate Basis	Rate/Acre	Total Amount Applied	Acres Cov.	Avail N (Lbs/A)	Avail P_2O_5 (Lbs/A)	Avail K_2O (Lbs/A)
FSN 122-2	May 2014	Corn grain	28-0-0	Surface broadcast	Custom	42 Gal	8 Gal	0.2	125	0	0
FSN 122-2	Mar 2015	Small grain	46-0-0	Surface broadcast	Custom	180 Lbs	36 Lbs	0.2	83	0	0
FSN 122-2	May 2016	Corn grain	28-0-0	Surface broadcast	Custom	42 Gal	8 Gal	0.2	125	0	0
FSN 122-3	May 2012	Corn grain	28-0-0	Surface broadcast	Custom	42 Gal	29 Gal	0.7	125	0	0
FSN 122-3	Mar 2013	Small grain	46-0-0	Surface broadcast	Custom	180 Lbs	126 Lbs	0.7	83	0	0
FSN 122-3	May 2014	Corn grain	28-0-0	Surface broadcast	Custom	42 Gal	29 Gal	0.7	125	0	0
FSN 122-3	Mar 2015	Small grain	46-0-0	Surface broadcast	Custom	180 Lbs	126 Lbs	0.7	83	0	0
FSN 122-3	May 2016	Corn grain	28-0-0	Surface broadcast	Custom	42 Gal	29 Gal	0.7	125	0	0

6.8. Field Nutrient Balance (Manure-spreadable Area)

Year	Field	Size	Crop	Yield Goal	Fertilizer Recs[1]			Nutrients Applied[2]			Balance After Recs[3]			Balance After Removal[4]	
		Acres		/Acre	N Lb/A	P_2O_5 Lb/A	K_2O Lb/A	N Lb/A	P_2O_5 Lb/A	K_2O Lb/A	N Lb/A	P_2O_5 Lb/A	K_2O Lb/A	P_2O_5 Lb/A	K_2O Lb/A
2012	FSN 4-1	12.1	Corn grain	160	160	0	0	156	93	122	-4	93	122	23	76
2013	FSN 4-1	12.1	Small grain	60	90	0	0								
2013	FSN 4-1	12.1	Soybean	45	0	0	0	69	0	0	-5†	93	122	-43	-8
2014	FSN 4-1	12.1	Corn grain	160	160	0	0	150	93	122	-4†	186	244	23	76
2015	FSN 4-1	12.1	Small grain	60	90	0	0								
2015	FSN 4-1	12.1	Soybean	45	0	0	0	69	0	0	-5†	186	244	-43	-8
2016	FSN 4-1	12.1	Corn grain	160	160	0	0	150	93	122	-4†	279	366	23	76
Total	**FSN 4-1**				**660**	**0**	**0**	**594**	**279**	**366**					
2012	FSN 4-2	16.3	Corn grain	160	160	0	0	156	93	122	-4	93	122	23	76
2013	FSN 4-2	16.3	Small grain	60	90	0	0								
2013	FSN 4-2	16.3	Soybean	45	0	0	0	69	0	0	-5†	93	122	-43	-8
2014	FSN 4-2	16.3	Corn grain	160	160	0	0	150	93	122	-4†	186	244	23	76
2015	FSN 4-2	16.3	Small grain	60	90	0	0								
2015	FSN 4-2	16.3	Soybean	45	0	0	0	69	0	0	-5†	186	244	-43	-8
2016	FSN 4-2	16.3	Corn grain	160	160	0	0	150	93	122	-4†	279	366	23	76
Total	**FSN 4-2**				**660**	**0**	**0**	**594**	**279**	**366**					
2012	FSN 4-3	11.4	Small grain	60	75	0	0								
2012	FSN 4-3	11.4	Soybean	45	0	0	0	69	0	0	-6	0	0	-66	-84
2013	FSN 4-3	11.4	Corn grain	160	160	0	0	60	93	122	-100	93	122	23	76
2014	FSN 4-3	11.4	Small grain	60	90	0	0								
2014	FSN 4-3	11.4	Soybean	45	0	0	0	69	0	0	-5†	93	122	-43	-8
2015	FSN 4-3	11.4	Corn grain	160	160	0	0	150	93	122	-4†	186	244	23	76
2016	FSN 4-3	11.4	Small grain	60	90	0	0								
2016	FSN 4-3	11.4	Soybean	45	0	0	0	69	0	0	-5†	186	244	-43	-8
Total	**FSN 4-3**				**575**	**0**	**0**	**417**	**186**	**244**					
2012	FSN 9-1	16.7	Corn grain	150	130	60	120	126	94	123	-4	34	3	28	79
2013	FSN 9-1	16.7	Small grain	60	90	40	40								
2013	FSN 9-1	16.7	Soybean	45	0	20	80	69	0	0	-5†	-26	-117	-38	-5

Year	Field	Size	Crop	Yield Goal	Fertilizer Recs[1]			Nutrients Applied[2]			Balance After Recs[3]			Balance After Removal[4]	
		Acres		/Acre	N Lb/A	P_2O_5 Lb/A	K_2O Lb/A	N Lb/A	P_2O_5 Lb/A	K_2O Lb/A	N Lb/A	P_2O_5 Lb/A	K_2O Lb/A	P_2O_5 Lb/A	K_2O Lb/A
2014	FSN 9-1	16.7	Corn grain	150	130	60	120	120	94	123	-4†	34	3	28	79
2015	FSN 9-1	16.7	Small grain	60	90	40	40								
2015	FSN 9-1	16.7	Soybean	45	0	20	80	69	0	0	-5†	-26	-117	-38	-5
2016	FSN 9-1	16.7	Corn grain	150	130	60	120	120	94	123	-4†	34	3	28	79
Total	**FSN 9-1**				**570**	**300**	**600**	**504**	**282**	**369**					
2012	FSN 10-1-2	21.9	Corn grain	150	130	120	120	126	93	122	-4	-27	2	27	78
2013	FSN 10-1-2	21.9	Small grain	60	90	80	40								
2013	FSN 10-1-2	21.9	Soybean	45	0	10	80	69	0	0	-5†	-90	-118	-39	-6
2014	FSN 10-1-2	21.9	Corn grain	150	130	120	120	120	93	122	-4†	-27	2	27	78
2015	FSN 10-1-2	21.9	Small grain	60	90	80	40								
2015	FSN 10-1-2	21.9	Soybean	45	0	10	80	69	0	0	-5†	-90	-118	-39	-6
2016	FSN 10-1-2	21.9	Corn grain	150	130	120	120	120	93	122	-4†	-27	2	27	78
Total	**FSN 10-1-2**				**570**	**540**	**600**	**504**	**279**	**366**					
2012	FSN 79-1-2	17.0	Small grain	60	75	0	0								
2012	FSN 79-1-2	17.0	Soybean	45	0	0	0	69	0	0	-6	0	0	-66	-84
2013	FSN 79-1-2	17.0	Corn grain	150	130	0	0	60	93	122	-70	93	122	27	78
2014	FSN 79-1-2	17.0	Small grain	60	90	0	0								
2014	FSN 79-1-2	17.0	Soybean	45	0	0	0	69	0	0	-5†	93	122	-39	-6
2015	FSN 79-1-2	17.0	Corn grain	150	130	0	0	120	93	122	-4†	186	244	27	78
2016	FSN 79-1-2	17.0	Small grain	60	90	0	0								
2016	FSN 79-1-2	17.0	Soybean	45	0	0	0	69	0	0	-5†	186	244	-39	-6
Total	**FSN 79-1-2**				**515**	**0**	**0**	**387**	**186**	**244**					
2012	FSN 79 3-4	24.0	Corn grain	150	130	0	60	126	93	122	-4	93	62	27	78
2013	FSN 79 3-4	24.0	Small grain	60	90	0	20								
2013	FSN 79 3-4	24.0	Soybean	45	0	0	40	69	0	0	-5†	93	2	-39	-6
2014	FSN 79 3-4	24.0	Corn grain	150	130	0	60	120	93	122	-4†	186	64	27	78
2015	FSN 79 3-4	24.0	Small grain	60	90	0	20								
2015	FSN 79 3-4	24.0	Soybean	45	0	0	40	69	0	0	-5†	186	4	-39	-6
2016	FSN 79 3-4	24.0	Corn grain	150	130	0	60	120	93	122	-4†	279	66	27	78

Year	Field	Size	Crop	Yield Goal	Fertilizer Recs[1]			Nutrients Applied[2]			Balance After Recs[3]			Balance After Removal[4]	
		Acres		/Acre	N Lb/A	P_2O_5 Lb/A	K_2O Lb/A	N Lb/A	P_2O_5 Lb/A	K_2O Lb/A	N Lb/A	P_2O_5 Lb/A	K_2O Lb/A	P_2O_5 Lb/A	K_2O Lb/A
Total	**FSN 79 3-4**				**570**	**0**	**300**	**504**	**279**	**366**					
2012	FSN 97 1-2	11.7	Small grain	60	75	0	0								
2012	FSN 97 1-2	11.7	Soybean	45	0	0	0	69	0	0	-6	0	0	-66	-84
2013	FSN 97 1-2	11.7	Corn grain	150	130	0	0	61	95	124	-69	95	124	29	80
2014	FSN 97 1-2	11.7	Small grain	60	90	0	0								
2014	FSN 97 1-2	11.7	Soybean	45	0	0	0	69	0	0	-5†	95	124	-37	-4
2015	FSN 97 1-2	11.7	Corn grain	150	130	0	0	121	95	124	-3†	190	248	29	80
2016	FSN 97 1-2	11.7	Small grain	60	90	0	0								
2016	FSN 97 1-2	11.7	Soybean	45	0	0	0	69	0	0	-5†	190	248	-37	-4
Total	**FSN 97 1-2**				**515**	**0**	**0**	**389**	**190**	**248**					
2012	FSN 122-1	4.9	Corn grain	150	130	120	60	128	97	127	-2	-23	67	31	83
2013	FSN 122-1	4.9	Small grain	60	90	80	20								
2013	FSN 122-1	4.9	Soybean	45	0	10	40	69	0	0	-4†	-90	7	-35	-1
2014	FSN 122-1	4.9	Corn grain	150	130	120	60	122	97	127	-2†	-23	74	31	83
2015	FSN 122-1	4.9	Small grain	60	90	80	20								
2015	FSN 122-1	4.9	Soybean	45	0	10	40	69	0	0	-4†	-90	14	-35	-1
2016	FSN 122-1	4.9	Corn grain	150	130	120	60	122	97	127	-2†	-23	81	31	83
Total	**FSN 122-1**				**570**	**540**	**300**	**510**	**291**	**381**					
2012	FSN 122-2	3.3	Corn grain	150	130	120	120	124	99	129	-6	-21	9	33	85
2013	FSN 122-2	3.3	Small grain	60	90	80	40								
2013	FSN 122-2	3.3	Soybean	45	0	10	80	69	0	0	-4†	-90	-111	-33	1
2014	FSN 122-2	3.3	Corn grain	150	130	120	120	118	99	129	-6†	-21	9	33	86
2015	FSN 122-2	3.3	Small grain	60	90	80	40								
2015	FSN 122-2	3.3	Soybean	45	0	10	80	69	0	0	-4†	-90	-111	-33	2
2016	FSN 122-2	3.3	Corn grain	150	130	120	120	118	99	129	-6†	-21	9	33	87
Total	**FSN 122-2**				**570**	**540**	**600**	**498**	**297**	**387**					
2012	FSN 122-3	4.1	Corn grain	150	130	120	120	127	95	125	-3	-25	5	29	81
2013	FSN 122-3	4.1	Small grain	60	90	80	40								
2013	FSN 122-3	4.1	Soybean	45	0	10	80	69	0	0	-5†	-90	-115	-37	-3

Year	Field	Size	Crop	Yield Goal	Fertilizer Recs[1]			Nutrients Applied[2]			Balance After Recs[3]			Balance After Removal[4]	
		Acres		/Acre	N Lb/A	P_2O_5 Lb/A	K_2O Lb/A	N Lb/A	P_2O_5 Lb/A	K_2O Lb/A	N Lb/A	P_2O_5 Lb/A	K_2O Lb/A	P_2O_5 Lb/A	K_2O Lb/A
2014	FSN 122-3	4.1	Corn grain	150	130	120	120	121	95	125	-3†	-25	5	29	81
2015	FSN 122-3	4.1	Small grain	60	90	80	40								
2015	FSN 122-3	4.1	Soybean	45	0	10	80	69	0	0	-5†	-90	-115	-37	-3
2016	FSN 122-3	4.1	Corn grain	150	130	120	120	121	95	125	-3†	-25	5	29	81
Total	**FSN 122-3**				**570**	**540**	**600**	**507**	**285**	**375**					

Field Nutrient Balance (Non-manure-spreadable Area)

Year	Field	Size	Crop	Yield Goal	Fertilizer Recs[1]			Nutrients Applied[2]			Balance After Recs[3]			Balance After Removal[4]	
		Acres		/Acre	N Lb/A	P_2O_5 Lb/A	K_2O Lb/A	N Lb/A	P_2O_5 Lb/A	K_2O Lb/A	N Lb/A	P_2O_5 Lb/A	K_2O Lb/A	P_2O_5 Lb/A	K_2O Lb/A
2012	FSN 4-3	0.3	Small grain	60	75	0	0								
2012	FSN 4-3	0.3	Soybean	45	0	0	0	69	0	0	-6	0	0	-66	-84
2013	FSN 4-3	0.3	Corn grain	160	160	0	0	0	0	0	-160	0	0	-70	-46
2014	FSN 4-3	0.3	Small grain	60	90	0	0								
2014	FSN 4-3	0.3	Soybean	45	0	0	0	83	0	0	-7	0	0	-66	-84
2015	FSN 4-3	0.3	Corn grain	160	160	0	0	155	0	0	-5	0	0	-70	-46
2016	FSN 4-3	0.3	Small grain	60	90	0	0								
2016	FSN 4-3	0.3	Soybean	45	0	0	0	83	0	0	-7	0	0	-66	-84
Total	**FSN 4-3**				**575**	**0**	**0**	**390**	**0**	**0**					
2012	FSN 9-1	0.2	Corn grain	150	130	60	120	125	0	0	-5	-60	-120	-66	-44
2013	FSN 9-1	0.2	Small grain	60	90	40	40								
2013	FSN 9-1	0.2	Soybean	45	0	20	80	83	0	0	-7	-60	-120	-66	-84
2014	FSN 9-1	0.2	Corn grain	150	130	60	120	125	0	0	-5	-60	-120	-66	-44
2015	FSN 9-1	0.2	Small grain	60	90	40	40								
2015	FSN 9-1	0.2	Soybean	45	0	20	80	83	0	0	-7	-60	-120	-66	-84
2016	FSN 9-1	0.2	Corn grain	150	130	60	120	125	0	0	-5	-60	-120	-66	-44
Total	**FSN 9-1**				**570**	**300**	**600**	**541**	**0**	**0**					
2012	FSN 10-1-2	2.0	Corn grain	150	130	120	120	125	0	0	-5	-120	-120	-66	-44
2013	FSN 10-1-2	2.0	Small grain	60	90	80	40								
2013	FSN 10-1-2	2.0	Soybean	45	0	10	80	83	0	0	-7	-90	-120	-66	-84

Year	Field	Size	Crop	Yield Goal	Fertilizer Recs[1]			Nutrients Applied[2]			Balance After Recs[3]			Balance After Removal[4]	
		Acres		/Acre	N Lb/A	P_2O_5 Lb/A	K_2O Lb/A	N Lb/A	P_2O_5 Lb/A	K_2O Lb/A	N Lb/A	P_2O_5 Lb/A	K_2O Lb/A	P_2O_5 Lb/A	K_2O Lb/A
2014	FSN 10-1-2	2.0	Corn grain	150	130	120	120	125	0	0	-5	-120	-120	-66	-44
2015	FSN 10-1-2	2.0	Small grain	60	90	80	40								
2015	FSN 10-1-2	2.0	Soybean	45	0	10	80	83	0	0	-7	-90	-120	-66	-84
2016	FSN 10-1-2	2.0	Corn grain	150	130	120	120	125	0	0	-5	-120	-120	-66	-44
Total	**FSN 10-1-2**				**570**	**540**	**600**	**541**	**0**	**0**					
2012	FSN 79-1-2	4.9	Small grain	60	75	0	0								
2012	FSN 79-1-2	4.9	Soybean	45	0	0	0	69	0	0	-6	0	0	-66	-84
2013	FSN 79-1-2	4.9	Corn grain	150	130	0	0	0	0	0	-130	0	0	-66	-44
2014	FSN 79-1-2	4.9	Small grain	60	90	0	0								
2014	FSN 79-1-2	4.9	Soybean	45	0	0	0	83	0	0	-7	0	0	-66	-84
2015	FSN 79-1-2	4.9	Corn grain	150	130	0	0	125	0	0	-5	0	0	-66	-44
2016	FSN 79-1-2	4.9	Small grain	60	90	0	0								
2016	FSN 79-1-2	4.9	Soybean	45	0	0	0	83	0	0	-7	0	0	-66	-84
Total	**FSN 79-1-2**				**515**	**0**	**0**	**360**	**0**	**0**					
2012	FSN 79 3-4	2.2	Corn grain	150	130	0	60	125	0	0	-5	0	-60	-66	-44
2013	FSN 79 3-4	2.2	Small grain	60	90	0	20								
2013	FSN 79 3-4	2.2	Soybean	45	0	0	40	83	0	0	-7	0	-60	-66	-84
2014	FSN 79 3-4	2.2	Corn grain	150	130	0	60	125	0	0	-5	0	-60	-66	-44
2015	FSN 79 3-4	2.2	Small grain	60	90	0	20								
2015	FSN 79 3-4	2.2	Soybean	45	0	0	40	83	0	0	-7	0	-60	-66	-84
2016	FSN 79 3-4	2.2	Corn grain	150	130	0	60	125	0	0	-5	0	-60	-66	-44
Total	**FSN 79 3-4**				**570**	**0**	**300**	**541**	**0**	**0**					
2012	FSN 97 1-2	7.4	Small grain	60	75	0	0								
2012	FSN 97 1-2	7.4	Soybean	45	0	0	0	69	0	0	-6	0	0	-66	-84
2013	FSN 97 1-2	7.4	Corn grain	150	130	0	0	0	0	0	-130	0	0	-66	-44
2014	FSN 97 1-2	7.4	Small grain	60	90	0	0								
2014	FSN 97 1-2	7.4	Soybean	45	0	0	0	83	0	0	-7	0	0	-66	-84
2015	FSN 97 1-2	7.4	Corn grain	150	130	0	0	125	0	0	-5	0	0	-66	-44
2016	FSN 97 1-2	7.4	Small grain	60	90	0	0								
2016	FSN 97 1-2	7.4	Soybean	45	0	0	0	83	0	0	-7	0	0	-66	-84

Year	Field	Size	Crop	Yield Goal	Fertilizer Recs[1]			Nutrients Applied[2]			Balance After Recs[3]			Balance After Removal[4]	
		Acres		/Acre	N Lb/A	P_2O_5 Lb/A	K_2O Lb/A	N Lb/A	P_2O_5 Lb/A	K_2O Lb/A	N Lb/A	P_2O_5 Lb/A	K_2O Lb/A	P_2O_5 Lb/A	K_2O Lb/A
Total	**FSN 97 1-2**				**515**	**0**	**0**	**360**	**0**	**0**					
2012	FSN 122-2	0.2	Corn grain	150	130	120	120	125	0	0	-5	-120	-120	-66	-44
2013	FSN 122-2	0.2	Small grain	60	90	80	40								
2013	FSN 122-2	0.2	Soybean	45	0	10	80	83	0	0	-7	-90	-120	-66	-84
2014	FSN 122-2	0.2	Corn grain	150	130	120	120	125	0	0	-5	-120	-120	-66	-44
2015	FSN 122-2	0.2	Small grain	60	90	80	40								
2015	FSN 122-2	0.2	Soybean	45	0	10	80	83	0	0	-7	-90	-120	-66	-84
2016	FSN 122-2	0.2	Corn grain	150	130	120	120	125	0	0	-5	-120	-120	-66	-44
Total	**FSN 122-2**				**570**	**540**	**600**	**541**	**0**	**0**					
2012	FSN 122-3	0.7	Corn grain	150	130	120	120	125	0	0	-5	-120	-120	-66	-44
2013	FSN 122-3	0.7	Small grain	60	90	80	40								
2013	FSN 122-3	0.7	Soybean	45	0	10	80	83	0	0	-7	-90	-120	-66	-84
2014	FSN 122-3	0.7	Corn grain	150	130	120	120	125	0	0	-5	-120	-120	-66	-44
2015	FSN 122-3	0.7	Small grain	60	90	80	40								
2015	FSN 122-3	0.7	Soybean	45	0	10	80	83	0	0	-7	-90	-120	-66	-84
2016	FSN 122-3	0.7	Corn grain	150	130	120	120	125	0	0	-5	-120	-120	-66	-44
Total	**FSN 122-3**				**570**	**540**	**600**	**541**	**0**	**0**					

[1] Fertilizer Recs are the crop fertilizer recommendations. The N rec accounts for any N credit from previous legume crop.

[2] Nutrients Applied are the nutrients expected to be available to the crop from that year's manure applications plus nutrients from that year's commercial fertilizer applications and nitrates from irrigation water. With a double-crop year, the total nutrients applied for both crops and the year's balances are listed on the second crop's line.

[3] For N, Nutrients Applied minus Fertilizer Recs for indicated crop year. Also includes amount of residual N expected to become available that year from prior years' manure applications. For P_2O_5 and K_2O, Nutrients Applied minus Fertilizer Recs *through* the indicated crop year, with positive balances carried forward to subsequent years. Negative values indicate a potential need to apply additional nutrients.

[4] Nutrients Applied minus amount removed by harvested portion of crop through the indicated year. Positive balances are carried forward to subsequent years.

¤ Indicates a custom fertilizer recommendation in the Fertilizer Recs column.

[a] Indicates in the Balance After Recs N column that the legume crop is assumed to utilize some or all of the supplied N.

† Indicates in the Balance After Recs N column that the value includes residual N expected to become available that year from prior years' manure applications.

6.9. Manure Inventory Annual Summary

Manure Source	Plan Period	On Hand at Start of Period	Total Generated	Total Imported	Total Trans-ferred In	Total Applied	Total Exported	Total Trans-ferred Out	On Hand at End of Period	Units
Barn 1	Jan '12 - Dec '12	40	200	0	0	0	0	200	40	Ton
Barn 2	Jan '12 - Dec '12	40	200	0	0	0	0	200	40	Ton
Stackhouse	Jan '12 - Dec '12	200	0	0	400	312	80	0	208	Ton
All Sources	**Jan '12 - Dec '12**	**280**	**400**	**0**	**400**	**312**	**80**	**400**	**288**	**Ton**
Barn 1	Jan '13 - Dec '13	40	200	0	0	0	0	200	40	Ton
Barn 2	Jan '13 - Dec '13	40	200	0	0	0	0	200	40	Ton
Stackhouse	Jan '13 - Dec '13	208	0	0	400	121	275	0	212	Ton
All Sources	**Jan '13 - Dec '13**	**288**	**400**	**0**	**400**	**121**	**275**	**400**	**292**	**Ton**
Barn 1	Jan '14 - Dec '14	40	200	0	0	0	0	200	40	Ton
Barn 2	Jan '14 - Dec '14	40	200	0	0	0	0	200	40	Ton
Stackhouse	Jan '14 - Dec '14	212	0	0	400	312	90	0	209	Ton
All Sources	**Jan '14 - Dec '14**	**292**	**400**	**0**	**400**	**312**	**90**	**400**	**289**	**Ton**
Barn 1	Jan '15 - Dec '15	40	200	0	0	0	0	195	45	Ton
Barn 2	Jan '15 - Dec '15	40	200	0	0	0	0	195	45	Ton
Stackhouse	Jan '15 - Dec '15	209	0	0	390	121	275	0	203	Ton
All Sources	**Jan '15 - Dec '15**	**289**	**400**	**0**	**390**	**121**	**275**	**390**	**293**	**Ton**
Barn 1	Jan '16 - Dec '16	45	200	0	0	0	0	200	45	Ton
Barn 2	Jan '16 - Dec '16	45	200	0	0	0	0	200	45	Ton
Stackhouse	Jan '16 - Dec '16	203	0	0	400	312	90	0	201	Ton
All Sources	**Jan '16 - Dec '16**	**293**	**400**	**0**	**400**	**312**	**90**	**400**	**291**	**Ton**

6.10. Fertilizer Material Annual Summary

Product Analysis	Plan Period	Product Needed Jan - Aug	Product Needed Sep - Dec	Total Product Needed	Units
46-0-0	Jan '12 - Dec '12	7,905	0	7,905	Lbs
28-0-0	Jan '12 - Dec '12	2,771	0	2,771	Gal
46-0-0	Jan '13 - Dec '13	16,449	0	16,449	Lbs
46-0-0	Jan '14 - Dec '14	8,283	0	8,283	Lbs
28-0-0	Jan '14 - Dec '14	2,564	0	2,564	Gal
46-0-0	Jan '15 - Dec '15	16,449	0	16,449	Lbs
28-0-0	Jan '15 - Dec '15	1,449	0	1,449	Gal
46-0-0	Jan '16 - Dec '16	8,283	0	8,283	Lbs
28-0-0	Jan '16 - Dec '16	2,564	0	2,564	Gal

6.11. Whole-farm Nutrient Balance (Manure-spreadable Area)

	N (Lbs)	P_2O_5 (Lbs)	K_2O (Lbs)
Total Manure Nutrients on Hand at Start of Plan[1]	11,172	8,712	11,424
Total Manure Nutrients Collected[2]	79,800	62,300	81,600
Total Manure Nutrients Imported[3]	0	0	0
Total Manure Nutrients Exported[4]	32,319	25,191	33,048
Total Manure Nutrients on Hand at End of Plan[5]	11,619	9,061	11,881
Total Manure Nutrients Applied[6]	47,076	36,484	47,861
Available Manure Nutrients Applied[7]	29,641	36,484	47,861
Commercial Fertilizer Nutrients Applied[8]	47,014	0	0
Available Nutrients Applied[9]	76,655	36,484	47,861
Nutrient Utilization Potential[10]	141,614	57,048	60,027
Nutrient Balance of Spreadable Acres[11*]	-64,959	-20,564	-12,166
Average Nutrient Balance per Spreadable Acre per Year[12*]	-91	-29	-17

1. Values indicate total manure nutrients present in storage(s) at the beginning of the plan.
2. Values indicate total manure nutrients collected on the farm.
3. Values indicate total manure nutrients imported onto the farm.
4. Values indicate total manure nutrients exported from the farm to an external operation.
5. Values indicate total manure nutrients present in storage(s) at the end of plan.
6. Values indicate total nutrients present in land-applied manure. Losses due to rate, timing and method of application are not included in these values.
7. Values indicate available manure nutrients applied on the farm based on rate, time and method of application. These values are based on the total manure nutrients applied (row 6) after accounting for state-specific nutrient losses due to rate, time and method of application.
8. Values indicate nutrients applied as commercial fertilizers and nitrates contained in irrigation water.
9. Values are the sum of available manure nutrients applied (row 7) and commercial fertilizer nutrients applied (row 8).
10. Values indicate nutrient utilization potential of crops grown. For N the value generally is based on crop N recommendation for non-legume crops and crop N uptake or other state-imposed limit for N application rates for legumes. P_2O_5 and K_2O values generally are based on fertilizer recommendations or crop removal (whichever is greatest).
11. Values indicate available nutrients applied (row 9) minus crop nutrient utilization potential (row 10). Negative values indicate additional nutrient utilization potential and positive values indicate over-application.
12. Values indicate average per acre nutrient balance. Values are calculated by dividing nutrient balance of spreadable acres (row 11) by the number of spreadable acres in plan and by the length of the plan in years. Negative values indicate additional average per acre nutrient utilization potential and positive values indicate average per acre over-application.

* Non-trivial, positive values for N indicate that the plan was not properly developed. Negative values for N indicate additional nutrient utilization potential which may or may not be intentional. For example, plans that include legume crops often will not

utilize the full N utilization potential for legume crops if manure can be applied to non-legume crops that require N for optimum yield. Positive values for P_2O_5 and/or K_2O do not necessarily indicate that the plan was not developed properly. For example, producers may be allowed to apply N-based application rates of manure to fields with low soil test P values or fields with a low potential P-loss risk based on the risk assessment tool used by the state. Negative values for P_2O_5 and K_2O indicate that planned applications to some fields are less than crop removal rates.

Plan Nutrient Balance (Non-manure-spreadable Area)

	N (Lbs)	P_2O_5 (Lbs)	K_2O (Lbs)
Commercial Fertilizer Nutrients Applied[1]	7,412	0	0
Nutrient Utilization Potential[2]	9,528	1,626	2,520
Nutrient Balance of Non-spreadable Acres[3*]	-2,116	-1,626	-2,520
Average Nutrient Balance per Non-spreadable Acre per Year[4*]	-24	-18	-28

1. Values indicate nutrients applied as commercial fertilizers and nitrates contained in irrigation water.
2. Values indicate nutrient utilization potential of crops grown based on crop fertilizer recommendations.
3. Values indicate commercial fertilizer nutrients applied (row 1) minus crop nutrient utilization potential (row 2). Negative values indicate additional nutrient utilization potential and positive values indicate over-application.
4. Values indicate average per acre nutrient balance. Values are calculated by dividing nutrient balance of non-spreadable acres (row 3) by number of non-spreadable acres in plan. Negative values indicate additional average per acre nutrient utilization potential and positive values indicate average per acre over-application.

* Non-trivial, positive values for N indicate that the plan was not properly developed. Negative values for N indicate additional nutrient utilization potential which may or may not be intentional. Positive values for P_2O_5 and/or K_2O do not necessarily indicate that the plan was not developed properly. For example, multiple year applications may have been planned during the final plan year(s) and these nutrients will not be utilized by crops in the current plan. Negative values for P_2O_5 and K_2O indicate that applications to some fields may have been delayed to allow the producer to apply the nutrients in accordance with their fertilization schedule.

6-12. Projected Soil P & K levels.

Projected Soil P And K Levels

Plan File: S:\TENNESSEE-projects\David E. Rollins Jr\D & R Farm-NMP, 2012-2016\D & R Farm.mmp***Last Saved:*** 2/22/2012
Operation: D & R Farm ***State:*** Tennessee ***Init. File Rev:*** 11/8/2011

Field ID	*Sub ID*	*P Level At Start Of Plan*	*P Level At End Of Plan*	*K Level At Start Of Plan*	*K Level At End Of Plan*	*Units*
FSN 4-1		148	139	197	250	Lb/A
FSN 4-2		153	144	388	430	Lb/A
FSN 4-3		100	85	307	320	Lb/A
FSN 9-1		29	33	88	145	Lb/A
FSN 10-1-2		8	15	83	136	Lb/A
FSN 79-1-2		146	148	212	227	Lb/A
FSN 79 3-4		43	48	144	199	Lb/A
FSN 97 1-2		146	115	452	469	Lb/A
FSN 122-1		14	29	119	180	Lb/A
FSN 122-2		8	26	61	126	Lb/A
FSN 122-3		8	15	66	125	Lb/A

Notes
Equations used to determine change in soil test P and K:
Change in P (Lb/A) = Net P2O5/ 5/9
Change in K (Lb/A) =Net K/4

Section 7. Feed Management

Not applicable at this time.

Section 8. Other Utilization Options

All litter will be sold off-site or applied to Field 1 according to the NMP.

No “Other Utilization” options are being practiced at this time.

Section 9. Record Keeping Forms
Annual Reports 2011-2015

9.1. Producer Activity Checklist

Calendar Year _____

Activity	Jan	Feb	Mar	April	May	June	July	August	Sept	Oct	Nov	Dec
Soil Sampling **Date / Initials**												
Manure Sampling **Date / Initials**												
Spreader or Equipment Calibration **Date / Initials**												
Record Manure Volume Storage: **Volume / Initials**	X	X	X	X	X	X	X	X	X	X	X	X
Record Manure Volume Storage: **Volume / Initials**												
Record Manure Volume Storage: **Volume / Initials**												
Mow Grass on Earthen Berm **Date / Initials**												
Other **Date / Initials**												
Recordkeeping (see forms on following pages)	X	X	X	X	X	X	X	X	X	X	X	X

Notes: An X indicates that the indicated activity is scheduled for that month. Duplicate this form as needed for additional years.

9.2. Inspection/Monitoring Records

Date	Activity Description	Operator/ Inspector	Activity Data

9.3. Crop Records

Field	Crop	Planting Date	Hybrid or Variety	Pop-ulation Planted	Crop Residue (%) (1)	Tillage and Dates	Harvest Date	Yield/ Acre

(1) Percent residue cover left after planting

9.4. Manure Application Records

App. #	Field	Date	Manure Source	Equipment	Days to Incorp.	Rate/A Gal or Ton	Loads	Total Applied Gal or Ton	Acres Cov.
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									

App. #	Hauler's Name (1)	Ground Cover % (2)	Soil Condition (3)	Air Temp. (4)	Wind Speed (5)	Wind Dir. (6)	Weath-er (7)	Rain Before (8)	Rain After (9)	Notes/Comments
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										

(1) Name or initials of the person who applied the manure.
(2) Percent residue or ground cover at time of application.
(3) Soil condition at time of application: Dry, Firm, Wet, Muddy, Snow-Covered, Frozen.
(4) Air temperature at time of application.
(5) Wind speed at time of application: Calm (0-2 mph), Light (2-5 mph), Breezy (5-15 mph), Windy (>15 mph).
(6) Wind direction at time of application: N, NE, E, SE, S, SW, W, NW.
(7) Weather condition at time of application: Sunny, Partly Cloudy, Cloudy, Rain, Snow.
(8) Amount of rainfall during the 24 hours prior to application.
(9) Amount of rainfall during the 24 hours after application.

9.5. Commercial Fertilizer and Irrigation Water Application Records

Field	Date	Analysis (1)	Form Dry or Liquid	Application Method	Material Rate/A Lbs or Gal	Total Applied Lbs or Gal	Acres Cov.	Notes/Comments

(1) With commercial fertilizers, enter the analysis in the form of N-P_2O_5-K_2O (examples: anhydrous ammonia is 82-0-0, diammonium phosphate is 18-46-0). With irrigation water, enter the nitrate concentration in ppm.

9.6. Manure Exports off the Farm

Manure Source	Date	Amount Gal or Ton	Receiving Operation	Address	Contact	Phone

9.7. Manure Imports onto the Farm

Manure's Animal Type and Form	Date	Amount Gal or Ton	Originating Operation	Address	Contact	Phone

9.8. Internal Transfers of Manure

Manure Source	Date	Amount Gal or Ton	Manure Destination	Purpose of Transfer

Section 10. References

10.1. Publications

Crop Fertilizer Recommendations

"Lime and Fertilizer Recommendations for the Various Crops of Tennessee," BEES Info #100, Aug 2008
http://soilplantandpest.utk.edu/publications/soilfertilizerpubs.htm

Manure Application Setback Features/Distances

Nutrient Management Standard 590
http://efotg.nrcs.usda.gov/references/public/TN/Nutrient_Management_(590)_Standard.doc

TN DEQ Rule 1200-4-5-.14(17)(d)
http://www.state.tn.us/sos/rules/1200/1200-04/1200-04-05.pdf

TN DEQ Rule 1200-4-5-.14(17)(d)
http://www.state.tn.us/sos/rules/1200/1200-04/1200-04-05.pdf

Manure Nutrient Availability

"Manure Application Management," Tables 3 and 4, Tennessee Extension, PB1510, 2/94
http://wastemgmt.ag.utk.edu/ExtensionProjects/extension_publications.htm

Phosphorus Assessment

"Tennessee Phosphorus Index," Tennessee NRCS, Nov. 2001

Practice Standards

Tennessee NRCS Nutrient Management Standard (590), Jan. 2003
http://efotg.nrcs.usda.gov/references/public/TN/Nutrient_Management_(590)_Standard.doc

10.2. Software and Data Sources

MMP Version	MMP 0.3.1.0
MMP Plan File	D & R Farm.mmp 2/22/2012 12:25:11 AM
MMP Initialization File for Tennessee	11/8/2011
MMP Soils File for Tennessee	8/29/2011
Phosphorus Assessment Tool	2009.02.20
NRCS Conservation Plan(s)	n/a
RUSLE2 Library	Version: 1.32.3.0 Build: Dec 17 2007 Science: 20061020
RUSLE2 Database	moses-TN.gdb